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E-Invoicing / E-Billing: Significant Market Transition Lies Ahead

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Contents

Table of Figures

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E-Invoicing is an essential element for successful B2B integration and increased profit

By Marco De Vries – Senior Director, Business Network Product Marketing

Electronic invoicing offers cost savings and increased efficiencies in a business-to-business (B2B) environment, and that value extends to both buyers and sellers. The use of E-Invoicing continues to grow as businesses respond to increasing customer demands, fast-evolving government mandates, and an ongoing desire to improve supply chain operations with a goal of increasing profits.

In a B2B environment, the ability to electronically exchange documents such as invoices with trading partners throughout the supply chain (customers, suppliers, banks, third-party logistics providers) provides a strong competitive advantage. Electronic invoicing should be considered an integral part of a successful B2B integration strategy. The benefits for companies that are connected to their partners are considerable.

- Speed. Saving time is the most obvious benefit. E-Invoicing shortens processing time and reduces the risk of errors inherent in manual processing. The fewer the errors, the less time required to resolve them. Additionally the need to make or answer calls for verification of receipt is minimized.
- Visibility. System-to-system document exchange between trading partners enables companies to have access to data faster – often in real time – to make better strategic and operational decisions.
- Cash flow. E-Invoicing provides financial benefits for both suppliers and customers. Customers are better able to take advantage of discounts when making payments early, or avoid late fees because of lost invoices or delayed processing. Shorting the in-voice to payment cycle improves a supplier's cash flow.
- Compliance. We also see that customers using electronic invoicing are better able to comply with government regulations across the globe. This is of particular importance to companies who do business in or with countries that use a value added tax (VAT).

The benefits of E-Invoicing are well documented, and the use E-Invoicing continues to increase every year. But, interestingly, many suppliers and buyers continue to send and receive thousands of paper invoices per year. Reasons often include the perceived complexity involved, a lack of resources, or technology that does not support electronic document exchange. Standards and protocols vary by industry and country, and trading partners have their own requirements. This makes a simple, cost effective solution challenging for many.

But the challenge can be met. Success will require finding the right combination of technology and resources. The best option for many options to assist your effort to increase the use of electronic invoicing, including the option to outsource some or all of your B2B integration projects.

We anticipate that over the next few years, those companies that embrace E-Invoicing as part of their B2B integration strategy will be stronger and more profitable than their competitors.

For more information: www.einvoicingbasics.com or www.opentext.com/eInvoicing

0. Executive Summary

Before the turn of the century, there were less than 15 specialised e-invoicing service providers worldwide. Soon may the number of network operators reach 1500. We estimate that the size of the global e-invoicing and enablement market in 2017 is Euro 3.3 billion, and that it will reach approximately Euro 16.1 billion in 2024.

The private industry was the main driver for the market development in phase one; however, it is now being increasingly supported by the governments. The VAT gap becomes more and more the main accelerator for the digitalisation of any business, fiscal, reporting, inventory, trade, and logistic documents.

The objective to significantly reduce the VAT gap cannot be achieved using models based on a voluntary participation with some incentives. Hence, tax payers are increasingly required to use real-time clearance models. In this case, organisations are required to exchange invoices via tax authorities, or to submit at least key invoice data in electronic format. Latin American, Asian and some European countries with the largest tax collection challenges implemented the clearance model first. The model might gradually conquer the world, and it is expected to be the dominant control method globally from 2025. It will eventually cover all kinds of fiscal documents, such as invoices, payment receipts, credit notes, debit notes, monthly salary statements etc. On the positive side, e-invoices that are issued using clearance models reduce tax compliance costs by 8-39% compared to paper invoices.

Today's business models evolved through decades, which focused on conventional paper processing. In Europe and North America, businesses and governments are usually taking a gradual approach to replacing these paper-based systems with digital substitutes. Small steps can only create incremental improvements.

A rapidly growing number of disruptive next-generation technologies lay a strong foundation as strategic drivers. They pave the way to substitute old solutions and processes by a completely new approach. A powerful market transition is taking place in our industry. This period of movement from one stage to another creates new opportunities for innovative and forward-thinking companies, which are ready to take advantage of this shift.

The invoice processing with its' high proportion of repetitive and rule based work is a key topic to be affected by the market transition ahead of us. This phase can mean an opportunity or a threat.

More than 90% of all invoices worldwide are still processed manually. This is absolutely unsatisfactory. Requirements for the clearance model may help to significantly increase the proportion of electronic invoicing. Emerging technologies like blockchain, cloud aggregation platforms, robotic process automation, machine learning and advanced analytics may pave the way to improve the degree of business process automation and exploit the full potential for savings.

The digital transformation is no longer an option, it's the imperative. It is rather the question how to unleash the power of the digitalisation while maintaining a healthy business.

For businesses and public-sector organisations, we see a need to change from a reactive to a proactive approach. This helps to avoid a heterogeneous solution, channel, format and process landscape. We recommend defining a holistic business process automation strategy as soon as possible. Reading this report can be a good start.

1. Introduction

1.1 The purpose of the Report

E-invoicing/e-billing is a rapidly expanding technology. Whereas Latin American and many European and Asian countries are already considerably advanced in this field, a vast majority of organisations have not yet decided upon one system or service.

A high number of providers offer solutions and services for this matter. In this phase, it is important to have up-to-date information and guidance on selecting the right solution and provider.

An independent international e-invoicing consultant and market analyst has written this report. Its purpose is to support invoice issuers and recipients wishing to replace expensive paper-based invoice management. It gives relevant information for succeeding with an e-invoicing project. The report not only provides facts, but also qualitative views, evaluation and details about the products offered by many providers.

1.2 Methodology

The author has worked in the e-invoicing business since 1997. During the first two years in Switzerland, he established one of the first e-billing/e-invoicing services in Europe. Since 1999, he has acted as an independent consultant and has made business plans, RFPs, system evaluations and many technical and marketing concepts for large invoice issuers and recipients, governments, integrators, solution and service providers. During this time, he has constantly collected important data about the relevant markets. The results are repeatedly published in newsletters and market reports.

The report is based on

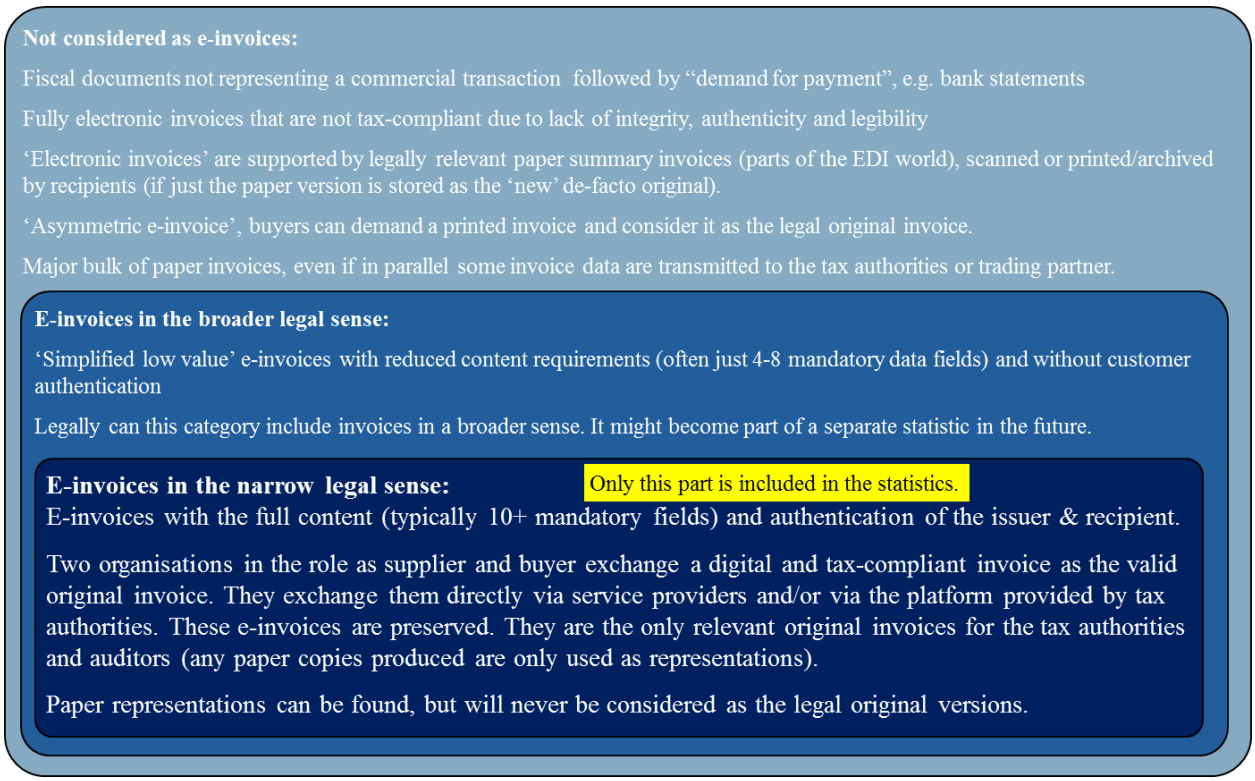
- Publicly available information; we gathered information from thousands of sources over the years and adjusted them
- Market research carried out by third parties (representing 15,000+ enterprises and 10,000+ consumers)
- Verification of important figures by customer/provider visits and/or calls
- Own in-depth experience from more than 160 customer consulting projects in 50+ countries
- Consolidation of the above information

1.3 Terms and definitions

The term “e-invoice” is used for the Business-to-Business (B2B) and Business-to-Government (B2G/G2B) segment. It includes exclusively the electronic invoice exchange between suppliers and buyers, but does not consider the data exchange between suppliers/buyers and tax authorities for reporting and control purposes. The legislation in EU countries considers a relatively broad definition: The issuing and receipt of VAT compliant invoices in an electronic format. Most national legislation mandates users to archive the e-invoices in its original (electronic) format, even if it were printed after receipt. This definition in Europe corresponds with the broad recognition by users and includes image-based digital invoices (mainly PDFs).

Definitions in other regions of the world differ greatly. Although, in any case, it is not valid, for others e-invoicing means much more than simply ‘automated invoicing’. In this report, ‘e-invoicing’ is used in the narrow legal sense as described below. Terms like ‘touchless e-invoicing’, ‘zero touch e-invoicing’ or ‘true e-invoicing’ are used in the event of structured e-invoices.

Figure 1: Definition of e-invoice in a global context



In this report, "e-billing" covers the electronic bills from Business-to-Consumers (B2C).
Note: Some market participants use this term alternatively for the process on the issuer side in general, regardless of whether the customer is an enterprise or household.

Remark: In the past, we included invoices/e-invoices in the statistics if they fulfilled the description as defined in their national legislation. Unfortunately, the figures were not completely comparable at a global level. This approach is now replaced by a common denominator, valid for a majority of countries around the world. The new figures are therefore lower than in past publications.

2. The market

2.1 Global market volume and value

2.1.1 Volume of invoices and invoice-like documents

2.1.1.1 Bills/Invoices

Whereas the volume (paper + electronic) in Europe and Latin America is relatively well known, figures for other continents may just be guessed.

Figure 2: Guess for global bill/invoice volume

Segment	Estimated annual volume to be at least
B2C/G2C	200 billion
B2B/B2G/G2B	200[1] billion
Total	**400 billion**

Source: Billentis

2.1.1.2 Invoice-like documents and messages

Additional volume of invoices in the broader legal sense and "invoice-like documents and messages" can also be tremendous (depending on country likely **5 to 15 times over the invoice volume**). Invoices are different from receipts (payslips, tickets). Both invoices and receipts are ways of tracking purchases of goods and services. In general, the content of the invoices can be similar to that of receipts including tracking the amount of the sale, calculating sales tax owed and calculating any discounts applied to the purchase. Classical examples of these "invoice-like documents and messages" are

- Invoice data sent to the tax authorities just for validation or audit reasons, e-reporting, VAT statements
- Digital replacements of "fiscal printers producing payment receipts". Electronic (payment) receipts, generated by tills at the Points of Sale (shops, restaurants, ticket counters) and sent to the tax authorities just for validation or audit reasons (e.g. in Taiwan and some Latin American countries); more accurate translations to English use the terms "electronic tax receipts" or "uniform invoices" for these messages.

2.1.2 Value of the e-invoicing market

E-invoicing market has been around for over 20 years now. Electronic documents have gradually replaced paper-based invoices. In phase one, the European market was developed mainly by private industry; globally it was advanced by high-volume industries. In the second phase of the market development, private industry was still the main driver. Nowadays, however, the main driver is an increasing number of governments, which require organisations to exchange invoices electronically. In this regard, Latin America is very advanced, followed by Asia. This trend can be seen around the world.

Billentis estimates that the size of the global e-invoicing and enablement market in 2017 is Euro 3.3 billion (USD 3.6 billion), and that it will reach approximately Euro 16.1 billion (USD 17.4 billion) in 2024.

[1] Compared to report 2016 slightly increased figure; got meanwhile more accurate figures from some larger countries.

One of the assumptions is that all Latin American and most Asian countries will have established a clearance model until 2024 that requires market participants to exchange invoices only in electronic format. The estimates include solutions and services that are directly related to e-invoicing, as defined in this report; e.g., exchange networks, communication gateways, SaaS, PaaS, implementation costs, value added services like data validation, formatting and synchronisation. Workflow, archive solutions, and processing of data that is related to invoices (purchase orders, catalogues, sourcing and payment) are not part of this estimate.

Asia and Latin America are expected to achieve the highest annual grow rates (CAGR 62% and CAGR 32%, respectively). Europe has the highest market value today but may achieve until 2024 only single-digit percent annual growth rates on average. On the one hand, this is because the starting basis is already high. Another important reason is that the unit prices may fall significantly faster than elsewhere. Now, the average cost per e-invoice is much higher than the average cost worldwide. This is due to the very fragmented market structure, the high number of small solution providers that operate mostly on the domestic market, different languages, legislations and standards. In contrast, countries with clearance models and e-invoicing requirements feature a highly standardized approach, and achieve a high proportion of electronic invoices. Interconnects between different e-invoicing network operators are not required in such countries, or otherwise are very easy and economical to implement and operate. Hence, the average cost per e-invoice in countries with clearance models is typically in the low single-digit Euro cent area.

2.2 Evolving market models

2.2.1 Overview

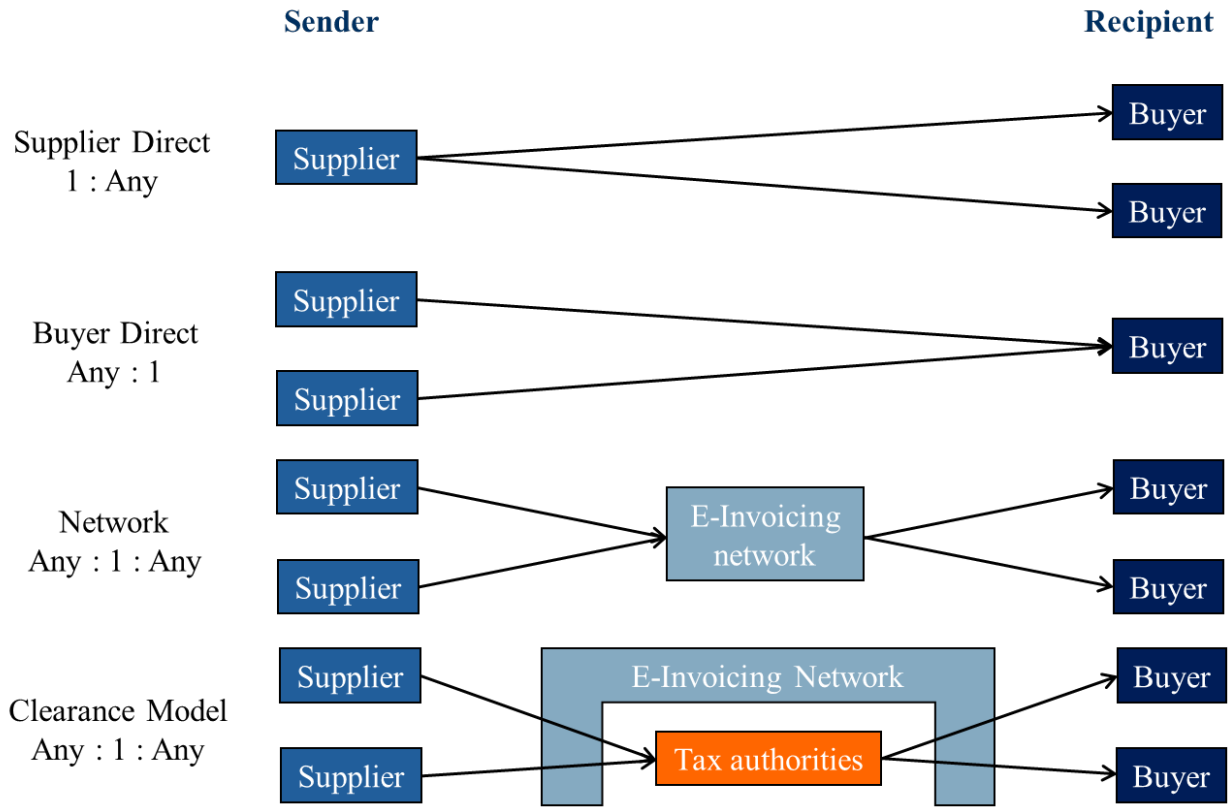
Many large organisations intend to exchange electronic business messages directly with their counterparts. This is still a good approach in the case of stable partnerships with very large trading parties and if the legal requirements for these messages are not very high.

The invoice can be seen as the “queen of documents/messages”. In most countries, it is THE document regarding VAT reclaim, for tax reasons and auditing. If paper based invoices are replaced by electronic invoices, it is essential to stay VAT compliant. Even if very large organisations prefer to exchange electronic invoices directly with their counterparts, the vast majority of companies are advised to use a professional third party service.

We distinguish between several e-invoicing models:

- Supplier Direct Model (in-house)
- Buyer Direct Model (in-house)
- Outsourced Direct Model: Software as a Service (SaaS), Platform as a Service (PaaS)
- Network Model, Third party operator service
- Hybrid Model
- Total Invoice Management (in-house or outsourced)
- Clearance model

Figure 3: Overview about main market models



2.2.2 Supplier Direct Model

A supplier implements an e-billing/e-invoicing solution within his environment for distributing the electronic invoices via different channels:

- Sends them to the customers via email, SMS, Apps etc.
- Provides the e-invoices on his customer portal; Customers can login, view and download them

The supplier direct model is quite popular in high-volume industries like telecommunications, utility and card companies, as well as online shopping portals. Small businesses also have a preference to exchange e-invoices directly with their trading partners. Due to their size, they do not have the capacity to provide e-invoices on their own portals, but instead exchange them as PDF invoices attached to emails.

2.2.3 Buyer Direct Model

A buyer implements an e-invoicing and/or invoice management solution within his environment for receiving the electronic invoices via different channels:

- Gets invoices directly as a data stream for importing them into his AP solution (preferred mainly for invoices of large suppliers)
- Smaller suppliers key-in the invoice data in a web-template on the corporate invoice portal of the buyer (webEDI); data can be automatically processed and imported into the AP system

This model is preferred by larger organisations with a limited number of suppliers.
The model can also be quite successful with smaller suppliers if orders are sent to them in electronic form alone (e.g. via extranet portal). Many solution providers offer a functionality to convert these purchase order data easily into an invoice for sending back to the buyer.

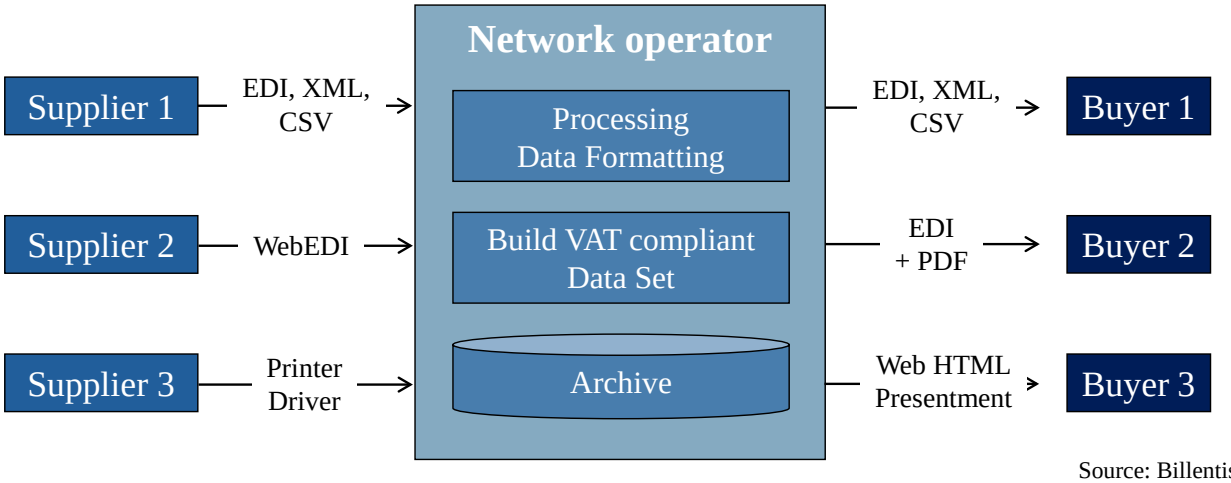
2.2.4 Direct Model as a Service

Over the years, large organisations using biller or buyer direct models concluded that the marketing rollout is harder than expected and that the maintenance of their applications is ultimately too expensive. That is why some service providers offer white-label services for them (SaaS, Software as a Service, PaaS, Platform as a Service). They run a direct model on behalf of large issuers and recipients of invoices. These providers typically develop, maintain and operate the software. Customers pay just a fixed integration fee and a volume/time based fee.

2.2.5 Network Model

Issuer and recipient have just one interface to their service provider, the network operator[2]. This e-invoicing network operator manages the VAT compliant invoice transfer to clients. Issuers can deliver invoice data (e.g. ERP output format, any XML data or a flat file) to the operator who translates it into the target format of the recipient. The operator supports the main legal requirements, authenticity and the end-to-end data integrity. An increasing number of operators offer additional services such as tax compliant long-term archiving.

Figure 4: Network Model



Source: Billentis

Large issuers and recipients intend to make a full integration into their AR and AP applications. SMEs often prefer easier and quicker solutions, either by using WebEDI or printer drivers. For both channels, suppliers' AR systems do not need any modification or upgrade. Use of e-invoicing is possible for them within hours after making their decision.

2.2.6 Hybrid Model

Message transfer with a few high-volume and strategic important counterparts is based on a direct model, whereas mid-sized and small counterparts are addressed via network operators.

Organisations using this model have combined the advantages and disadvantages of direct & network models.

Advantage: Good solution for all organisations already practising a direct model with chance for an efficient route to all smaller suppliers and customers.

[2] In some countries, the terms "consolidator", "service provider", "e-Commerce network", "B2B network", "e-invoice cloud", B2B cloud or "supplier network" are more common.

2.2.7 Different forms of clearance models for e-invoicing and e-reporting

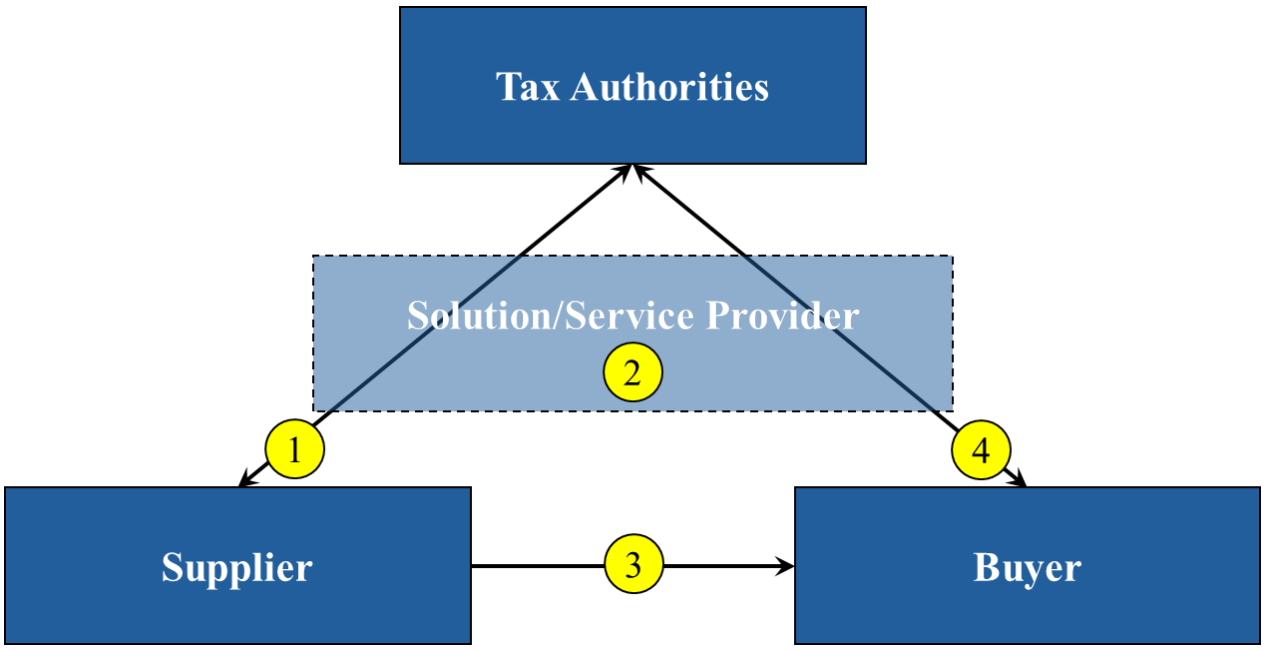
At least in the countries with VAT systems, an invoice is a key document to provide evidence for tax compliance. For historical reasons, most of these countries still practice the post-audit model, which means that tax audits happen years after the business transactions have taken place. This model has many disadvantages for taxpayers and tax authorities. It is also one major reason for tax evasion. This post-audit model is no longer up-to-date. Hence, we see a rapid change towards real-time or at least near real-time clearance models. In this case, organisations are required to exchange invoices via tax authorities, or to submit at least key invoice data in electronic format. Latin American, Asian and some European countries with the largest tax collection challenges implemented the clearance model first. The model might gradually conquer the world, and it is expected to be the dominant control method globally from 2025 [1]. It is already affecting most businesses operating internationally. The model might become the norm, but, unfortunately, not all countries will implement it in the same form.

Although invoice-relevant data can be exchanged using the same technical platforms, and following the same schemes and models, it is useful to distinguish between e-invoicing and e-reporting to tax authorities. Mainly in Asian publications, e-reporting from cash registers and virtual printers to tax authorities is often translated into English using the term “e-invoicing”. However, we use the term differently in this document.

Figure 5: Distinguishing between e-invoicing and e-reporting to tax authorities

E-invoicing	**E-reporting to tax authorities**
Both the supplier **and** the buyer have finally an electronic invoice that represents for tax purposes the **invoice original**. These invoices include the full content. In practice, it may be one document, or several documents, one of which contains all the core information relevant for tax purposes, with separate extensions that are more relevant to suppliers and buyers.	E-reporting includes reports of business transactions, extracts of invoices, declarations of any other fiscal data, and VAT records. It is devised to speed up processing of VAT statements and returns. In one application example, only the supplier has finally an electronic invoice, but sends the original invoice in paper form to the buyer. In another scenario, the parties exchange just an extract of the invoice electronically (which is suitable for reporting and tax audit purposes).

Figure 6: General principles of the Clearance Model



Item	Forms/Description
1	E-invoicing: In many countries, the tax authority issues invoice numbers ('folio') that must be used by suppliers. After creation, suppliers in some countries are required to provide full invoice data to the tax authorities and directly or indirectly to the buyers; a few tax authorities require these data already before supplies are shipped. The tax authority or accredited service providers validate the data and return them with electronic approval codes to the suppliers. E-reporting: Some countries require only invoice extracts in any format, or as Standard Audit File (SAF-T). Besides invoice data, suppliers must report other data of fiscal relevance. Until today, clearance models have been addressing mainly, but not only, the suppliers.
2	Most countries with clearance models require the use of certified software respectively accredited service providers for the data exchange between tax payers and tax authorities. These service providers format the data if necessary, and validate the tax relevant content and the identity of trading parties. They usually also provide buyers with e-invoices.
3	E-invoicing: As the supplier is required to produce structured invoice data for the tax authorities anyway, is he also able to provide these data in the appropriate format (structured and/or as PDF) directly to the buyer or does so via service providers.
4	Today, suppliers and buyers in some countries with clearance models still exchange invoices in paper form. Nevertheless, the probability that the invoices are also exchanged electronically is high (80%). Regardless of the invoice format, buyers are responsible for cross-checking invoice data against data reported by suppliers to tax authorities. Depending on country regulations, they may also be required to confirm receipt. Some countries offer incentives to do this voluntarily. Buyers are obliged to accept and pay only invoices that are validated by the clearance system.

Most countries in Latin America, as well as Turkey and some Asian countries are very advanced. The members of the Eurasian Economic Union also strongly encourage the clearance model. It is also practised in many countries in the Far East.

Europe is in the early stage of using this model. Within Europe, Southern and Eastern European countries are leading the trend. Portugal requires invoice issuers to report up to ten invoice records to tax authorities in electronic form. Certified software is required. From July 2017, Spain will require 62,000 businesses initially (both issuers and receivers) to report invoice records and other fiscal data electronically to tax authorities within 4-8 days of the transaction. Soon, the invoicing software used by Hungarian businesses will be required to have a direct data connection to the Hungarian tax authority. Hungarian businesses will be required to report sales invoice data in real-time if the VAT on a B2B invoice is at least HUF100,000 (approx. €320). Certified software will be required. We believe that the Hungarian e-reporting model also strongly encourages e-invoicing between suppliers and buyers. Italy seems to be preparing the basis for a future mandatory clearance model. Currently, Italy has a requirement system in place for electronic invoicing between suppliers and public sector agencies. Electronic B2G invoices are exchanged via a state-owned service provider. Italy now offers incentives to use the same exchange platform also for B2B invoices. A service for the creation, submission, and storage of e-invoices is provided for free to all VAT-registered businesses. Besides the opportunity to use this service for free, additional incentives are provided to users. The service also supports certain e-reporting features. This can be interpreted as a first step on the way towards a countrywide clearance model.

The objective to significantly reduce the VAT gap cannot be achieved using models based on a voluntary participation with some incentives. Hence, tax payers are increasingly required to use the clearance system. If they do not use it, use it improperly, or if they miss deadlines, they risk to be fined. Fines vary greatly, but are often high.

Some countries like Indonesia [2] and South Korea [3] charge penalties in the amount of 2% of the VAT base and 0.5-1% of the related sales for non-compliance and/or failure to apply the tax administration clearing system within the required time. In some countries, non-compliance of invoices/e-invoices may, in worst case, result in fines that are even higher than the value of the supply [1].

Expected future development of the clearance model

- It will eventually cover all kinds of fiscal documents, such as invoices, payment receipts, credit notes, debit notes, monthly salary statements etc.
- Pure e-reporting schemes are expected to evolve towards advanced e-invoicing clearance systems
- Buyers may increasingly be required to become full part of the electronic cycle (in step one, the requirements affect mainly the suppliers)
- It will include also cross-border invoices
- Periodical post audit or near-real-time systems will evolve into real-time models
- It will extend to inventory reporting
- It will be linked to the physical supply chain: supplies will be tracked and traced from the time they are imported into the country or produced domestically until they are sold. This information will be matched with the financial supply chain documentation, such as invoices.
- All steps from invoice issuance until collection will be tracked and traced.
- Geographic preferences for different forms of the clearance model in the next three years
    - Europe, Northern America, Pacific Region and Japan: Establish or improve clearance models with a main focus on reporting of sales invoices; incentives for voluntary implementation
    - The rest of advanced economies: In many countries, invoice issuers are required to use clearance models for e-reporting and e-invoicing. Invoice receivers are required to use them for electronic interaction with tax authorities and suppliers of goods and services.

Many readers may find the requirement for an e-invoicing and e-reporting clearance model unappealing at the first glance. Nevertheless, it is clear that both tax payers and service providers benefits from it:

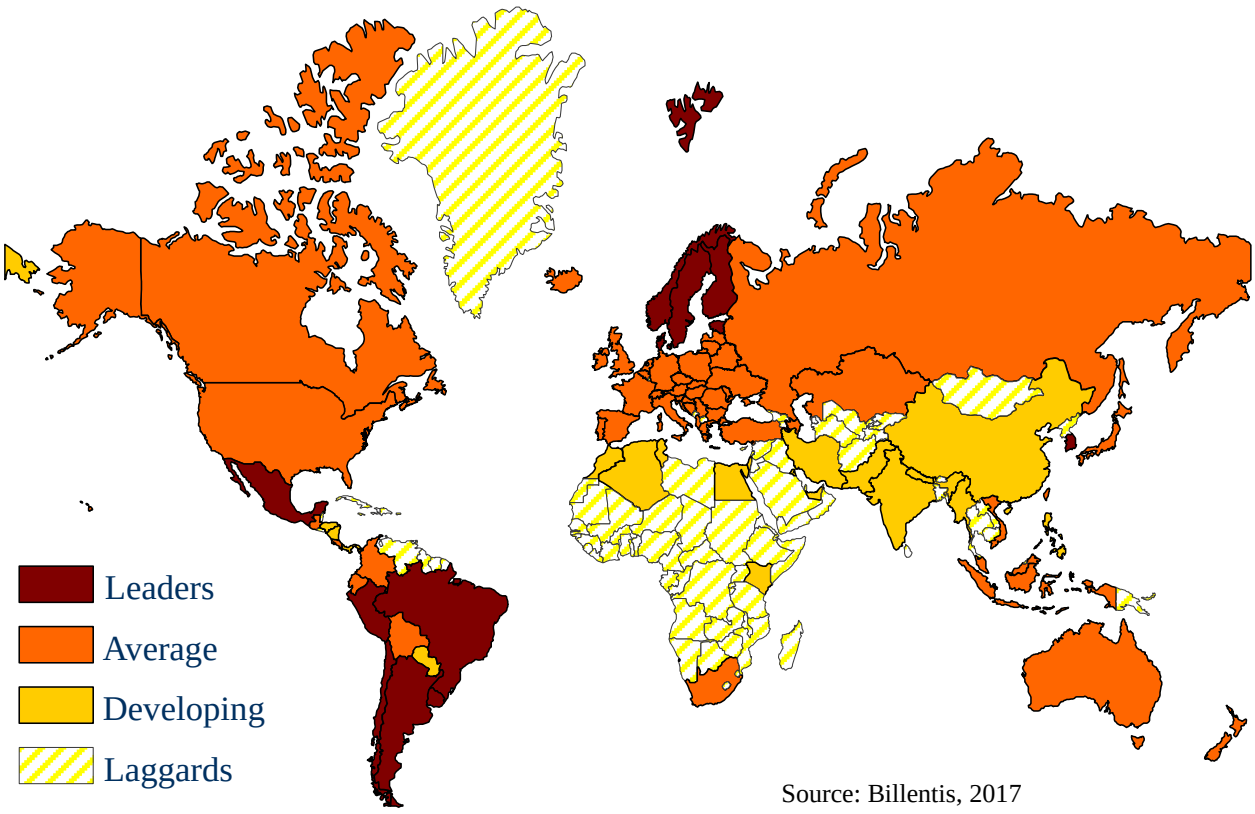
- On the positive side, e-invoices that are issued using clearance models reduce tax compliance costs by 37-39% for corporate businesses, and 8-56% for private businesses compared to paper invoices [3]. This encourages many multinational companies to push forward their e-invoice projects.
- The process is secure from the legal point of view due to mechanisms that guarantee the validity and rule out repudiation of origin. This will reduce fraud.
- Compared to the post audit systems, it ensures in real-time that fiscal documents are tax compliant. This significantly reduces the risk of fines, which could be imposed several years after the business transaction has taken place.
- Automation of tax relevant processes replaces manual and periodic reporting forms; VAT declaration & deduction are no longer required, and collection and refund can be done automatically.
- Scan and capture are eliminated, or reduced substantially.
- Where applied, it results in significant reduction of the VAT gap. This paves the way to decreasing tax rates in the future.
- Countrywide message standards are established, reducing the heterogeneity.
- Issues related to interoperability between service providers are easily solved, or become irrelevant.
- Very broad and rapid market adoption sharply increases the processed volume, resulting in much lower transaction costs compared to heterogeneous bottom-up market developments.
- Beneficial environment for the emergence of more innovative invoice and trade finance schemes.

2.3 The global landscape

2.3.1 Market maturity

The maturity of the market varies between continents and the countries on each continent.

Figure 7: Market maturity for electronic invoices/bills



Source: Billentis, 2017

The term “Laggards” in the chart above does not mean that there was no e-invoicing activity in these countries. It just expresses that they are typically in a very early stage. “Developing” means that countries have already some e-invoicing activities, typically in in the B2C segment and/or EDI between larger businesses.

It is expected that the 2017 volume for e-bills/e-invoices will achieve at least 36 billion world-wide with annual growth rates of 10-20%.

Figure 8: Estimated volume of electronic invoices/bills in 2017

Recipient segment	Europe		LATAM		North America		APAC		Rest of World	
Consumer	4	↗	6	↗	4	↗	2	↗	0+	↗
Business & Government	5	↗	9	↗	4	↗	2*	↗	0+	↗

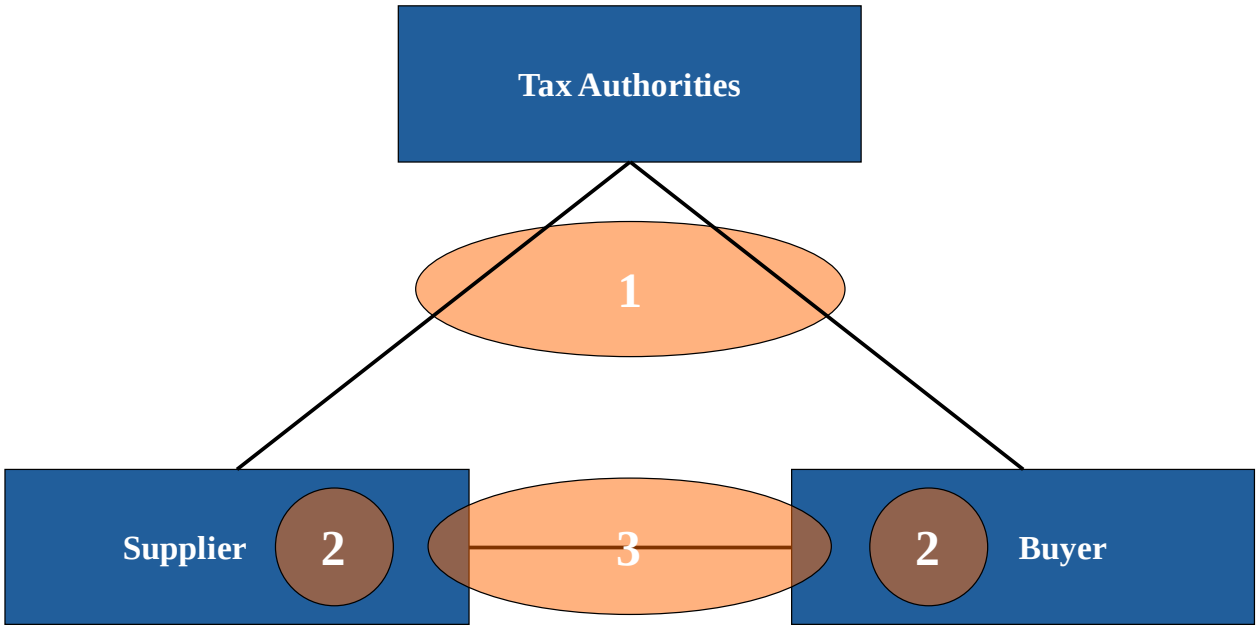
Estimated electronic invoices/bills 2017 (billions, strongly rounded) Relative growth rates ↗

*) This number could increase by several billions in case officially confirmed figures from Indonesia were contributed.

2.3.2 Current optimisation focus of geographical regions

There are many similarities as to how invoices are used in our world. The challenge to implement e-invoicing and to convince trading parties is also comparable. However, there are also major differences due to heterogeneous legislation, languages, cultures and the current optimisation focus. Although not applicable for all countries and organisations, we concluded that the optimisation focus seems to be as follows:

Figure 9: Optimisation focus of geographical regions



Focus	Description
1	**Asia & Latin America** (and increasingly some Southern and Eastern European countries): Country-wide projects are launched by the tax authorities with the aim of reducing tax evasion. Suppliers and buyers have to send either invoice data or at least reports in electronic format to the tax authorities for real-time validation & auditing. Typically, tax authorities completely disrupt the traditional paper scheme, as they design and implement a completely new system. The resulting clearance system for the trading parties is quite complex. The companies' internal invoice process efficiency and electronic collaboration between suppliers and buyers are not yet necessarily optimised, but VAT declaration and tax returns may become much easier and more efficient.
2	**North America:** Larger and mid-sized companies optimise mainly their internal processes. AR and AP automation as well as Trade Finance and Working Capital Management are a focus. However, the market becomes increasingly mature for focus 3.
3	**Major parts of Europe:** In contrast to Latin America, the conventional invoicing mechanisms and processing methods are not critically scrutinised, but replaced by a comparable working digital substitute. Suppliers and buyers can be located in various countries with different legislation. Much effort was done in EU member states to remove legal barriers. For Europeans, it is also important to build a framework, which is suitable for millions of companies of any size and from different countries. Hundreds of e-invoicing network operators offer their services, many of them interconnected with other providers. Suppliers and

Focus	Description
	buyers may in most countries use e-invoicing still on a voluntary base. Although the market is still quite fragmented, the approach in Europe can be described as relatively holistic with a strong intention to collaborate among all stakeholders.

In the long-run, all suppliers, buyers and the tax authorities want benefits with e-invoicing. This increases the chance that each continent learns from each other and adopts best-of-breed components from others.

2.3.3 Asia & Pacific region

Remark: We allocate Belarus, Turkey, Russia and Ukraine to Asia and not Europe.

E-invoicing in B2B is in some Asian countries not yet legally permitted, or only under strict legal conditions that sometimes include explicit approval from tax authorities. This does not rule out that some companies already exchange (in parallel to the tax relevant paper invoice) electronic invoice files ("commercial invoices") to improve process efficiency.

However, there are some very advanced countries. The leaders are **Singapore, Hong Kong, Taiwan and South Korea**. The government, shipping and retail industries play a key role in the B2B/B2G segment. Even though countries such as Singapore and Hong Kong have had rather lenient regulatory conditions for electronic invoicing and record keeping for many years now, adoption levels remain modest across most of Asia.

Australia and NZ are at a similar stage to Asia. Australians are embracing the electronic commerce phenomenon and are becoming increasingly more confident in electronic B2B transactions. The retail industry is already quite active regarding digital processes. Pushed by the National E-Health Transition Authority, the healthcare industry is increasingly exchanging health information and related messages like invoices electronically. A limited number of businesses achieved a considerable adoption rate regarding electronic business messages and invoices within their eco system. At this stage however, the majority of invoices in most other industries is exchanged paper-based or as PDF directly via email.

In early 2015, the Australian Government decided to actively push e-invoicing on a broad scale. As a result [4] of a consulting mandate, the author recommended a range of activities for the public and private sectors. Most of the recommendations have since been launched. A multi-stakeholder forum, the Australian Digital Business Council (ADBC, http://digitalbusinesscouncil.com.au/), was kicked off in December 2015. One of the council's first deliverables concerns a document for an e-invoicing interoperability framework [5]. First service providers have already implemented an interconnect based on this approach. The strong integration of the Australian Business Register for the country-wide rollout is worth particular mention. This should help to significantly improve invoice accuracy (issuer and receiver identification) and simultaneously reduce tax evasion.

Reducing tax evasion is also a serious challenge in Asia. **China** is no exception in that regard. To address this challenge, China launched a major fiscal reform project called the "Golden Tax Project" (GTP) which mandates the use of specific sophisticated information technologies to improve compliance with China's VAT laws. China introduced further regulations for its online invoice management system in a bid to standardize the industry and curb tax evasion. For using the online electronic invoicing system, taxpayers register at the tax authorities and open an account. To issue an invoice, they fill out the required information and issue the electronic "fapiao"

online. The issued fapiao is verified by matching the information against that in the online system. Compared to pure paper invoices, the taxpayer has the benefit that he has no longer to physically travel back and forth to the tax bureau to obtain and verify invoices. Further evolutionary steps around paperless billing/invoicing, reporting and archiving are now in progress or respectively being announced. New measures for managing accounting archives have now entered into force, thereby allowing the electronic archiving of e-invoices [6]. The new measures only treat the issue of archiving tax records, but do not regulate the e-invoicing process itself. A B2C pilot project run by the National Tax Bureau with a limited number of online retail stores is still in progress. A pilot project for B2B e-invoicing and archiving shall be extended in the near future. There are clear indications that these activities will play the first foundations towards a clearance system in the future.

India has made announcements about allowing e-invoicing more broadly; however, electronic invoicing remained rare because Central Sales Tax explicitly required paper invoices, while only about half of the states allowed e-invoicing under their VAT law. In early 2015, the legislation was changed, allowing all service-related and domestic invoices to be transmitted electronically from March 2015. India has also been working towards a national Goods and Service Tax (GST) scheme. It shall be implemented in 2017. A key component builds an IT backbone that digitizes the interaction with tax payers. The Company Goods and Service Tax Network (GSTN) [7] has been set up primarily to provide IT infrastructure and services to the Central and State Governments, tax payers and other stakeholders for implementation of the GST. After being issued their GST registration numbers, companies will be required to upload sales invoice data. This step for e-reporting builds an excellent basis for true e-invoicing between trading parties in the future.

It was announced that, from July 2016, almost all taxable entrepreneurs in **Indonesia** will be required to issue their VAT invoices (Faktur Pajak, FP) electronically and settle tax payments online only. On the buyer's side, the e-invoice they receive should be validated by the VAT input feature in the e-invoice application or by scanning the barcode or QR code list as inserted on the e-invoice. In practice, many buyers ask suppliers to provide them the Faktur Pajak in paper form before they make payments. This is to ensure that the Faktur Pajak has been reported to the Indonesian tax authority.

The administration [8] is able to estimate the size of the **Russian** market in the meaning of the definition in this report quite accurately. Around 3 billion invoices are exchanged every year in the B2B and B2G segment. E-invoicing activities started relatively late. Nevertheless, the current stage of e-invoicing in Russia may now be described as developing in a highly dynamic manner. It is predicted that the e-invoice volume in 2017 will increase by a factor of 2-3 compared to the previous year. This is also because the Federal Tax Service of Russia has established a unified data format to automate the circulation of e-documents (approved XML format for e-invoices and receipts of goods). Presently, more than 28 certified operators of electronic document flow are responsible for providing the delivery of information between taxpayers.

The size of the **Turkish** market amounts to two billion annual invoices/bills [9]. With respect to e-invoicing, the country has made huge progress during recent years. It implemented e-invoicing requirements gradually for an increasing number of industry sectors. In a first step, the Turkish Revenue Administration (TRA) established a state-owned e-invoicing platform. Third-party service providers (certified and linked to the state-owned service provider) are able to address the divergent market requirements. They are interconnected with the TRA platform and leverage market reach significantly. As the turnover threshold for using e-invoicing is decreased in 2017, the number of mandated businesses might rise to more than 100,000. All the invoices based on this e-invoice scheme are transmitted and received through the TRA system.

In addition, Turkey has introduced the e-archive scheme. The e-archive is positioned in Turkey as a new version of electronic invoicing. It paves the way for addressing new user groups, even if a recipient were not listed in the e-invoice registry. Current figures confirm that the e-archive is a very successful model to substitute paper invoices.

In the e-archive application, the invoices are transmitted to end users via electronic mail (in PDF format or structured data with an embedded 'style sheet') and invoices that are sent within the month are submitted to TRA as a report. Upon the request of end users, the e-archive invoice is printed out and can be delivered to its user as a hard copy. Fortunately, just around 10% of receivers are requiring this.

2.3.4 Africa

Most countries are in the phase when large bill issuers start with "Bill Presentment" via their company portals or mobile phones. Electronic Bill Presentment and Payment is already up and running in Egypt and Tunisia.

South Africa is the only country with a robust, albeit still nascent, market for e-invoicing on the African continent. A regulatory framework for e-invoicing has existed for many years, and was modernized in 2012.

With that exception, countries such as Morocco in the Maghreb region are slightly more advanced than the rest of Africa, however the mentality in both government and business appear to remain geared towards the use of paper in administrative processes. PDFs transmitted by email could lead the way for several years. Consumer bills are also highly accepted via mobile devices.

2.3.5 North America

Considering the annual survey of Fiserv, 24+ percent of all U.S. consumer bills are sent electronically, only with paper suppressed) [10].

In the B2B/B2G segment, the perceptions and objectives differ broadly from the European or Latin American approach. The optimisation of internal operations "order-to-cash, AR automation" and "purchase-to-pay, AP automation" is currently a main objective for US enterprises. Various surveys imply that the US is clearly past the early adoption phase of electronic invoicing and that the interest in this topic is rising sharply.

In relation to the huge size of this market, it may come as a surprise that in early 2017 there are still just around 180 e-invoicing network operators in place. Because the US does not have VAT, but a sales tax system, invoices are not considered any different from other business documents. It has therefore taken some time for the value of e-invoicing network operators to become recognized on the US market, but now the number of such operators is expected to increase steadily in the coming years. Another fact might also prove to be an accelerator for third party service providers: A high number of enterprises are interested in e-invoicing solutions, but are faced with a limited budget/funding. External services on demand instead of in-house solutions help to overcome this barrier as well.

Surveys also directly or indirectly taking consideration of the e-invoicing topic are relatively rare. Most currently focus on the AP side, and mainly with regard to very large businesses.

Considering various sources, the results/trends for larger businesses can be summarised as follows

- More than 40 percent use frontend scanning and OCR solutions for the invoice processing; trend: increasing
- Supplier portals are in place; trend: robust growth
- Commercial Cards (including purchasing, ePayment and virtual cards) are popular and common for purchases with a high volume, but a small amount. Using P-Cards is directly affecting the invoicing volume and the kind of processing; trend: moderate increase and expansion into the segment of high-value purchases
- Roughly 2/3rds of businesses issue PDF invoices via email, but less than 20% structured e-invoices via EDI
- For AP departments, e-invoicing is priority number 3-4 (behind imaging, scanning/OCR, workflow, matching)
- Third-party services like e-invoicing networks or alternatively SaaS becomes increasingly important. Using this service helps significantly reduce high in-house investments, but at the same time paves the way to exploit the saving potential; trend: increasing
- Around 50 percent of the B2B invoices are still paid by checks; trend: stays stable
- Any alternative invoice payment and cash optimisation instruments are clearly gaining momentum. Offerings for Dynamic Discounting and Supply Chain Financing vehicles are benefitting in particular.

The vast majority of US businesses, however, employ less than 500 employees. Their behaviour and their preferences are not sufficiently reflected in today's available surveys. If the market behaves in a way comparable to the corresponding user segment in other countries, we may soon expect a very solid growth of third party cloud services.

The US Federal Administration intends to make a huge step forwards. After a pilot programme which explored the feasibility and benefits of e-invoicing in the public sector, the Office of Management and Budget (OMB) released a memorandum [11] directing federal agencies to transition towards electronic invoicing. Government agencies must begin processing all invoices electronically by the end of FY 2018. They can do so either by migrating to a Federal Shared Service Provider (FSSP) and using the FSSP's e-invoicing solution, or by using an OMB-approved electronic invoicing solution such as the Department of the Treasury's Invoice Processing Platform (IPP). IPP has already been implemented at three out of four FSSPs and has nearly 80 agencies enrolled and using the service.

In 2015, the U.S. Federal Reserve identified improving End-to-End efficiencies in the U.S. payment system as a desired outcome in the Strategies to Improve the U.S. Payment System (SIPS) paper [12]. In June 2016, it published a follow up paper [13] outlining the challenges and opportunities of e-invoicing in the U.S. This paper identified several critical factors missing in the U.S., including a defined set of standards and frameworks to facilitate exchanging e-invoices, and a coordinated effort across the industry to align businesses and service providers to help develop strategies to increase adoption.

To support the desired outcome of increasing B2B payment efficiency, the Federal Reserve convened a new work group under the Business Payments Coalition [14] focused on increasing e-invoice adoption. Currently, the work group is creating a catalog of existing electronic invoice technical standards in use by U.S. businesses, and will release the catalog through Accredited Standards Committee X9 as a technical report in 2017. Additionally, the work group has established several other objectives to accelerate the adoption of electronic invoicing, including: Define what an electronic invoice is for the U.S. market; Develop a position paper on why the U.S.

market should adopt an e-invoice interoperability framework; Develop a framework for Increasing Adoption; and Develop a framework implementation guide.

2.3.6 Latin America

Chile may be identified as the root of the Latin American market model and its development. Other markets like Brazil and Mexico are among the early adopters and some of them overtook Chile due to strict mandates for the usage of e-invoicing in that country. Meanwhile, almost all other countries in Latin America are rapidly evolving.

Argentina's tax authority (AFIP) expanded the mandatory e-invoicing regime to all sectors of the economy in 2016. The AFIP requirement affects meanwhile almost one million taxpayers [15].

With very few exceptions e-invoicing is mandatory for all businesses in **Brazil** and around 1.4 million businesses issue e-invoices for goods [16]. This result was possible due to the strict implementation of its e-invoicing requirement several years ago. It is now a pleasure to see Brazil as one of the innovators for users in the retail segment. The project 'Nota Fiscal Eletrônica para Consumidor Final – NFC-e' was launched at the end of 2011. The aim of the NFC-e project is to provide an alternative to the current fiscal printers used in the retail segment in the form of a fully electronic solution, based on an XML file, including a digital signature which is authorised online before the payment at the point of sale. In addition, customers (individuals or businesses) with purchases above $ 5,000 are required to provide identification. NFC-e follows the same technical and operational model of the NF-e (B2B/B2B) used for all industry and wholesale companies in Brazil. NFC-e is already in operation in the majority of the states. NFC-e is the last frontier of electronic tax documents in Brazil. Soon all tax documents will be in the database of the Tax Administration prior to implementation. Electronic reporting and auditing plays a key role in Brazil. They consequently expand upon its reporting requirements significantly. From 2017, Brazil intends to require businesses to also submit monthly inventory and production reports. E-reporting or e-filing increasingly considers all documents relevant for tax purposes. This also includes documents regarding labour costs, employment etc.

After several years of following a voluntary approach, the **Chilean** tax authority declared a requirement for electronic invoicing. Consequently, at the end of 2016, around 420,000 businesses already issued e-invoices [17]. More than 88 percent of all invoices in the country are meanwhile exchanged electronically. The requirement to issue e-invoices forms one part of the model. On the other side, the tax authorities also offer incentives for recipients to provide electronic confirmation of received e-invoices. This shall ensure that business only consider the purchases of confirmed e-invoices in their monthly tax returns.

Colombia is also promoting the e-invoicing landscape. E-invoicing was voluntary in phase one, but it will become mandatory in the future. In October 2016, the Columbian Tax Administration DIAN officially announced [18] that the rollout for the mass market of e-invoicing has been started. For accelerating the market adoption, Columbia paved the way, changed their legislation and made the model similar to the ones in Chile and Peru. One speciality in the Columbian approach is however that factoring is officially a supported part of the model. Businesses can exchange the e-invoices via accredited e-invoicing service providers. From 2019, all businesses will be mandated to exchange invoices just in electronic format.

Combatting tax evasion is another major objective of the new system. It is the aim of the tax authorities DIAN to halve VAT evasion using this new electronic system.

Mexico is the leading country worldwide. In 2017, it will come close to its objective of digitalising all processes relevant for taxation. Electronic invoices for goods and services form a key part of this digitalisation. One of the last rollout steps for e-invoices will be the mandate for G2B and G2C invoices from mid-2017. After this step, Mexican organisations are expected to exchange just over 10 billion e-invoices on an annual basis.

Additional initiatives are being taken in Mexico beyond electronic invoicing. E-accounting has become mandatory for companies and individuals.

Besides efficiencies in the generation, distribution, archiving, collection and reduction in the use of paper, Mexico's positive results in the adoption of e-invoicing and e-accounting have paid off in the reduction of tax evasion. Mexico has already increased tax revenues by more than a third without raising tax rates and will further enhance electronic audits. This goes far beyond the reporting of accounting and invoice data. It also includes e-audit and documents regarding the relationship between businesses and their employees. For example, all the monthly salary slips must already be sent electronically.

In addition to the past and present activities regarding the domestic electronic exchange of tax relevant information, there are also projects in progress in order to consider cross-border invoices. Mexico intends to expand the international acceptance of electronic invoices across the American continent. The SAT is therefore working with tax authorities in several Latin American countries, the United States and Canada [6].

The approach in **Peru** takes international standards into consideration (UBL 2.0 as the content standard). It will enable easier integration with trading partners in the European Union as well as APEC (Asia-Pacific Economic Cooperation) countries. The Peruvian model has similarities with the Brazilian model, insofar as shipping documents are also encompassed. Either the 'Factura' or 'Boleta' should accompany the carrier in combination with the 'Guia de Remision' (signed bill of lading that forms part of the process). Around 85 percent of registered e-invoicing businesses use the system on a voluntary basis and only the remaining ones are currently mandated. However, the legislation prescribes that, by 2018, all invoices are to be exchanged by electronic means only.

In Latin America, the initiator for the market activities is in most cases the government. The driver for establishing countrywide e-invoicing is often the reduction of tax evasion through real-time or near real-time invoice validation by tax authorities. This can be achieved by mandating an electronic invoice loop between supplier, the tax authorities and the supplier.

Although the legal requirements are among the strictest worldwide, some countries in Latin America have taken over the global leadership role. Not only do some of them already have high market adoption rates, but their model is also inspiring larger countries in Asia and likely soon in Southern and Eastern Europe.

Typical characteristics of e-invoicing in Latin American countries are

- Unique/sequential invoice numbers (folio) provided by the tax authorities
- Use of digital signatures based on suppliers' certificates, issued by approved or state-run Certification Authorities.
- Imposed XML standards for tax authority clearance
- Steady reporting to the tax authorities: either in real-time prior to issuance or at least monthly.
- Consider the classical invoices, but also other tax documents like credit notes, debit notes, receipts respectively "boletas de ventas" or "tickets" as they are also named

- Increasing integration with the physical supply chain e.g. simultaneous print-out of ancillary transport documents based on a pre-approved invoice
- After review/approval of suppliers' invoices, tax authorities put a visible "stamp" to the e-invoices. It is either a country specific alphanumeric code or a barcode / QR code.
- Recipients often have to validate that the invoice was pre-approved by the tax administration
- Tax authorities validate either the invoice data real-time or data-mine to check invoices later.
- General archiving period is five years.

Service providers play a key role. In some countries, service providers are accredited to perform clearance services on behalf of the tax administration; such service providers may also offer value-added services around these regulated functions. While many service providers are local, a good number of them are active in several Latin American countries and already process a very remarkable invoice volume. They belong to the largest operators worldwide and some of them are now entering into the American and European market.

2.4 The European Market

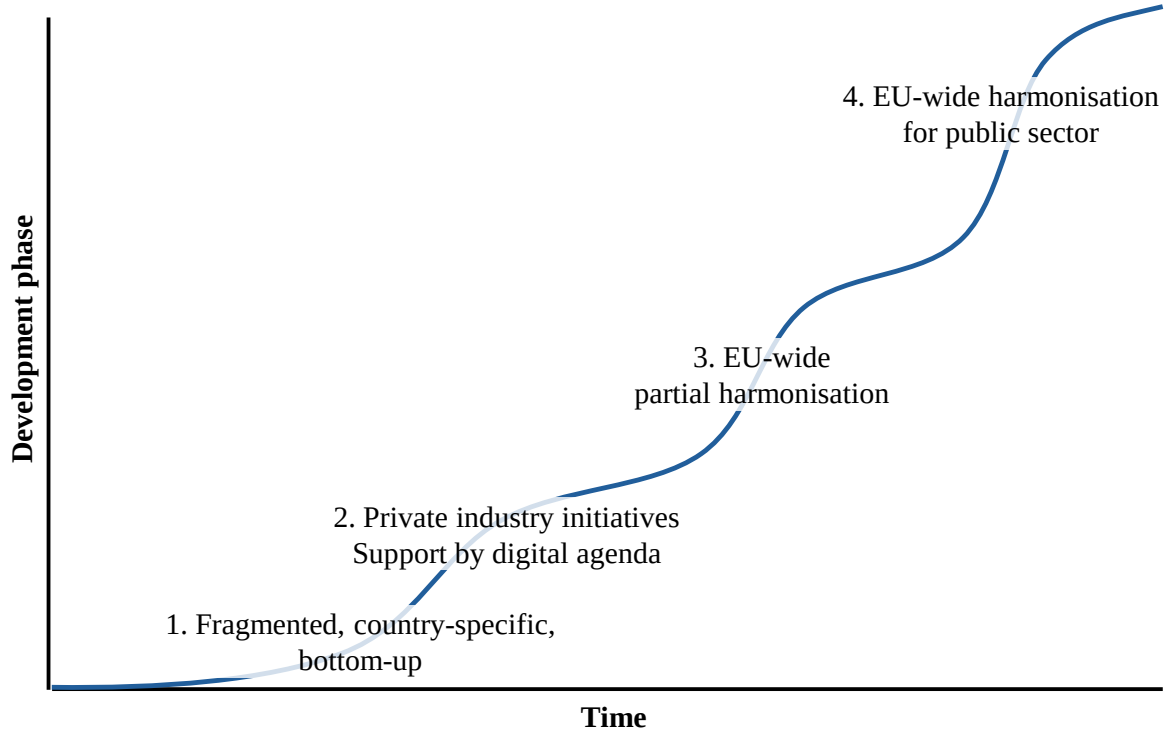
2.4.1 Market characteristics and development

The European landscape is not comparable with Latin America or the US for several reasons. Here just some facts about Europe in the narrow sense:

- 40+ countries (28 of them members of the European Union)
- 40+ legislations
- 100+ languages
- 22+ million SMEs (with less than 250 employees)

Europe has a long tradition of optimising electronic business processes, but the development happens step-by-step.

Figure 10: e-invoicing development in the European Union



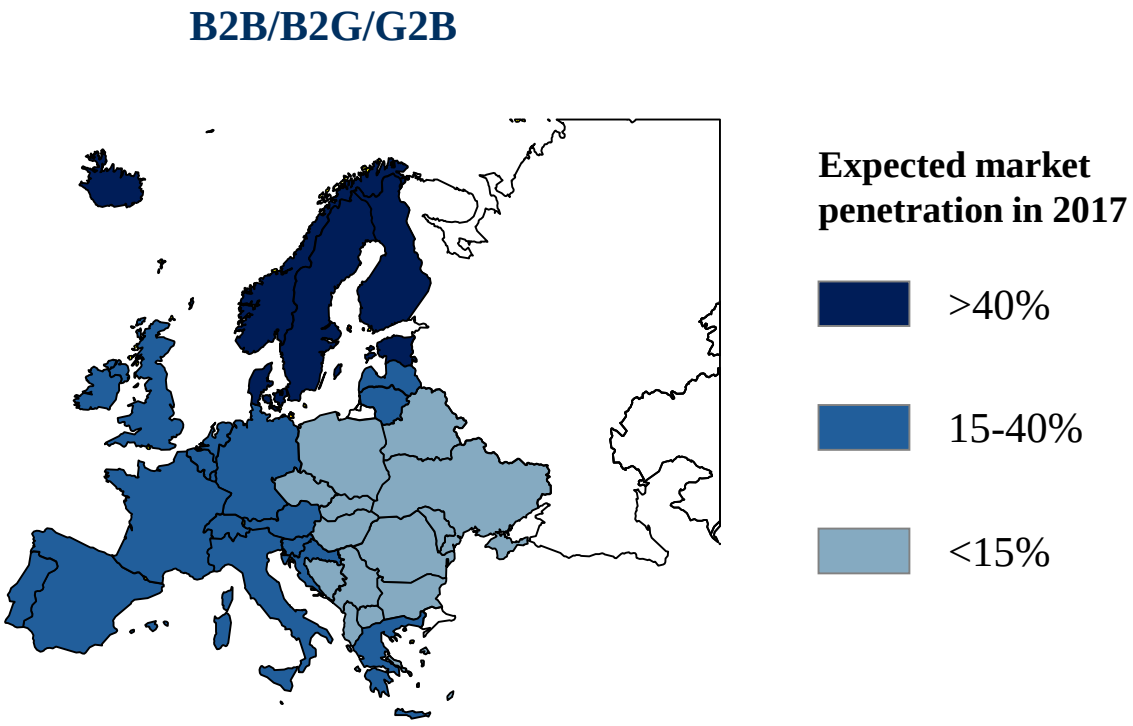
Phase	Description
1	Classical bottom-up growth in each single country, solution and service providers developed the market in the early stage, but with an isolated approach.
2	Especially the stakeholders in Nordic countries launched national initiatives for improving the collaboration. E-invoicing became increasingly a cornerstone of the digital agendas defined and pushed by the government; first national multi-stakeholder I were founded with the aim for faster market development and at least harmonisation on national level.
3	Due to the market fragmentation and growing cross-border trade, e-invoicing became a key topic also in the digital agenda and activity plans of the European Commission. It resulted in some directives, removal or reduction of barriers and standardisation work.
4	In 2014, Directives 2014/24/EU and 2014/55/EU were released. They will affect probably more than 300,000 Public Administrations in EU member states. They will be obliged from end of 2018 or 2019 to support a certain e-invoicing standard and to become able for automated processing of electronic invoices. In addition have they to change certain procurement processes towards electronic procedures. Although the obligation is valid just for the public sector is it obvious that it will have a major impact to the public sector as well as to all suppliers to the public sector.

2.4.2 The Business-to-Business & Business-to-Government market

2.4.2.1 Market penetration

Status and market development differ from country to country.

Figure 11: B2B/B2G/G2B: Estimated market penetration 2017 per country



2.4.2.2 Transition from large innovators to mass market

For almost a decade, solution providers, large billers and invoice recipients have shaped the market. Meanwhile, the vast majority of larger companies practice e-billing/e-invoicing.
The market development follows the decreasing size of the invoice streams:

1. Due to high volume and low legal barriers in the B2C sector, organisations with high outbound volume were first, offering electronic bills to consumers via their customer portals. This development started in most European countries before the millennium. In a second step, this "Electronic Bill Presentment" channel was enhanced with email delivery of PDFs, causing a huge jump in the number of users.
   In the B2B market, the e-invoicing market was initiated by large purchasing organisations, pushing their large suppliers to deliver electronic invoices.

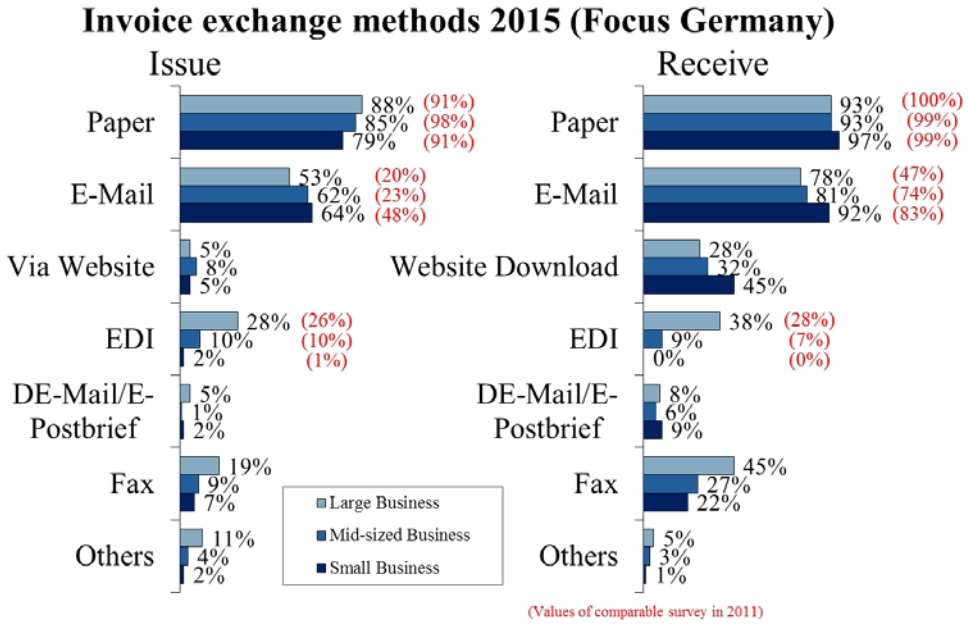
2. Due to the fragmented invoice situation, even large organisations did not achieve satisfactory electronic volumes just with their large trading partners. That is why we are now in the middle of the next evolutionary step: Addressing the SMEs. However, there is a limited but sharply increasing number of SMEs issuing and receiving electronic invoices. In most cases, SME projects have been initiated by large trading partners having pushed them to do so.

3. The next evolutionary step will be e-invoicing on the mass market. The various initiatives by the national public sectors and the European Commission could result in the break-through in this sector.

2.4.2.3 Exchange formats

The usage of formats and channels differs a great deal depending on the country and the size of companies. It is extremely rare for companies to issue or receive invoices just in one electronic format. Unfortunately, no international survey gathered such data on a comparable base. That is why we share here the results of a study done with survey participants in German-speaking countries in 2011 and 2015, with a focus on the largest European country.

Figure 12: Multi-channel invoice exchange methods in German speaking countries



Source: ibi research [19]

Multiple answers were possible. The majority of companies interviewed are located in Germany and are enriched with a few survey participants from Austria and Switzerland.

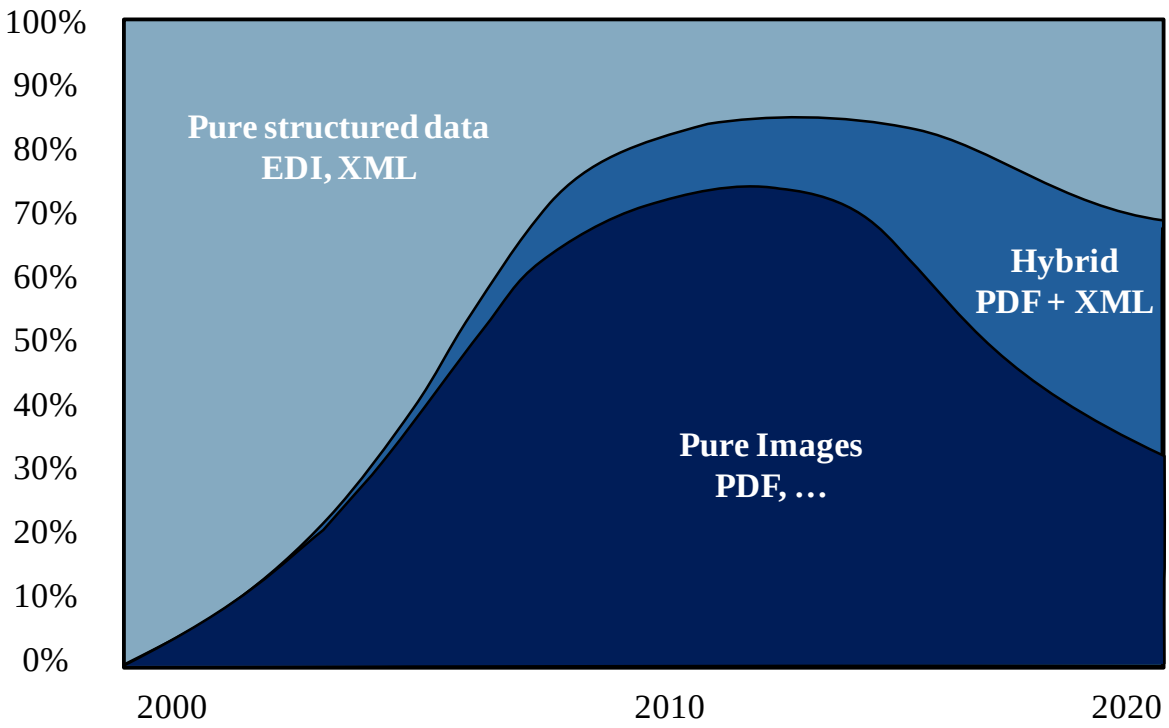
Conclusions for the European market

- Multi-channel exchange strongly dominates the landscape
- There are already some suppliers offering invoices exclusively in electronic format (e.g. online shops, subscribed services)
- Exchange via E-Mail is more popular than via EDI
- E-Mails are preferred by SMEs, but are also often accepted by larger companies

The long-term intention of most stakeholders is to exchange, process and archive most electronic invoices in a structured format. The high-volume industries (e.g. retail, automotive) were able to establish this in the first stage of market development. EDI, and in later years XML, dominated the e-invoicing landscape. Trading parties were typically larger enterprises. The more the mid-sized and smaller companies entered into the e-invoicing market, the more the PDF volume increased. The benefits of image-based PDFs are mainly limited to cheaper transport and archiving, but process automation does not really happen and cost savings stay limited.

In recent years, a combination of PDF+XML invoices gained ground. Either this happens with two separate files, or a XML data set is embedded in the PDF. This seems to be an appropriate way to simultaneously fulfil the requirements of large, mid-sized and small enterprises. It could be a way to reduce the current dominance of just image-based PDFs.

Figure 13: Proportion of various invoice formats



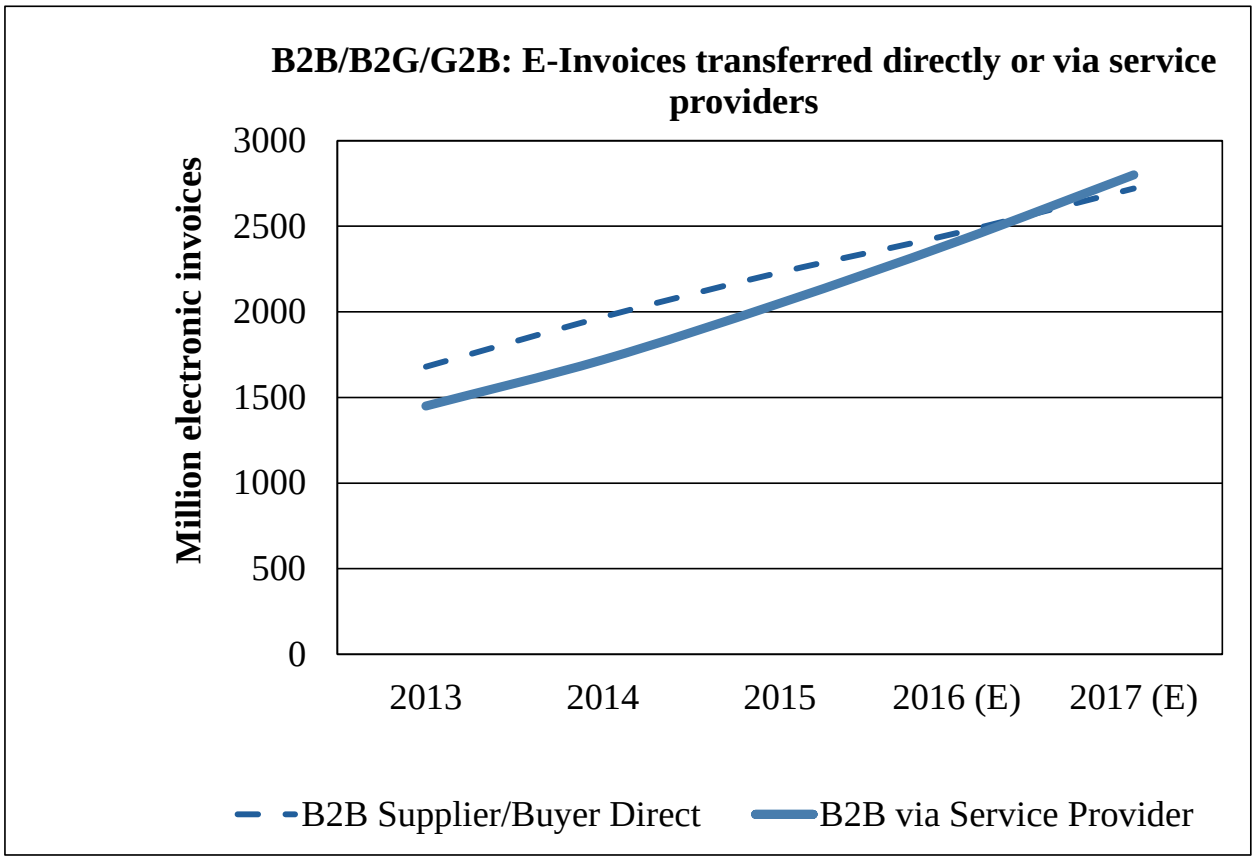
Recent surveys in countries like Austria, Estonia, Germany, Spain, the UK and the US indicate that in 2016, the proportion of PDF invoices was around 70% of all electronic invoices.

The public sector is definitively in the position to change the picture completely for the benefit of structured e-invoices. This is at least in progress in some countries. Governments mandating its suppliers to send invoices just in electronic format typically ask for XML and do not permit PDFs (e.g. Austria).

2.4.2.4 Distribution channels

The supplier direct model is currently dominating in many countries like Austria, Germany and the UK. Smaller pioneer countries intend to have a clear preference for e-invoicing network operators: Belgium, the Nordic countries, Slovenia and Switzerland.

Figure 14: Invoices received by European enterprises according to delivery channels



Source: Billentis

Some larger network operators are focussed on slower growing industries (retail, healthcare). In addition, some Nordic countries are already very advanced with a relatively high market penetration. Due to this basis effect, exponential growth is a challenge. Nevertheless, exponential growth rates are not out of reach. This could happen as soon as mid-sized or larger countries would start government initiatives for pushing electronic invoicing and procurement (high probability between 2018-2020 due to EU digital agenda and new directives).

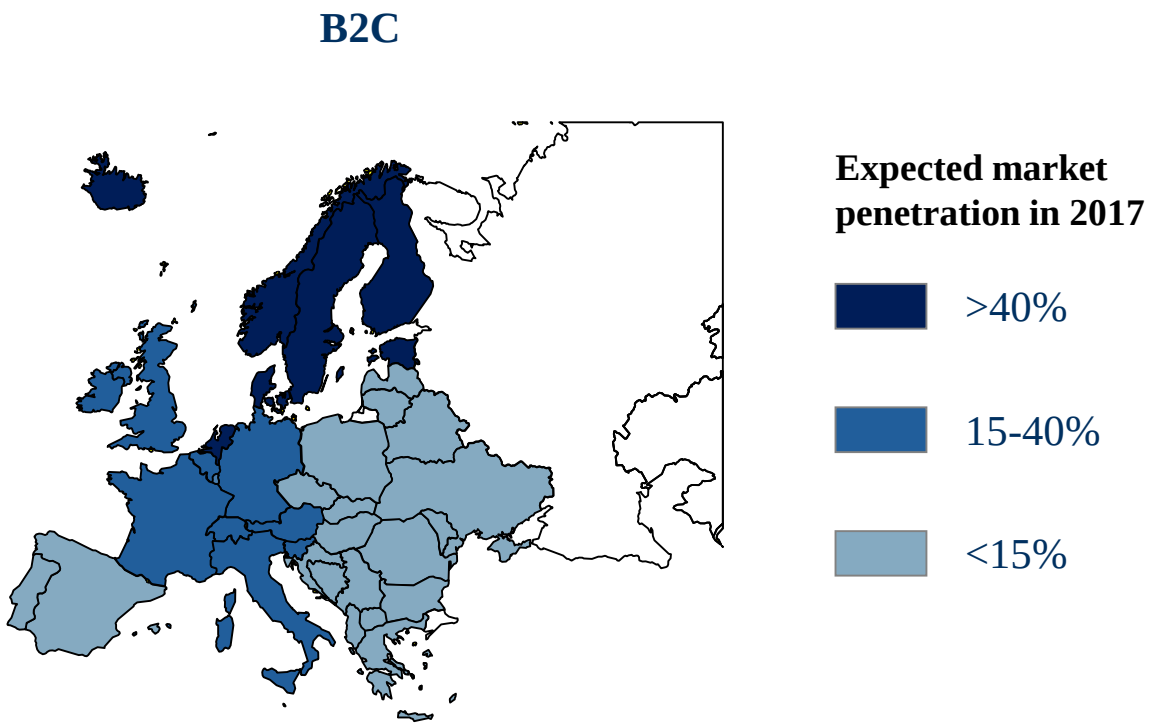
2.4.3 The Business-to-Consumer market

2.4.3.1 Market penetration

In the intercontinental context, the European payment options are in most countries relatively convenient. Collective payments, Electronic Fund Transfers and Direct Debits are quite popular bill payment methods. Payment did not turn out to be a driver for e-billing in Europe. There are also indications that European households receive (relatively) fewer bills than the consumers in most other continents do. Thus, e-billing is not yet very advanced in most European countries and the market penetration lags behind the development in the B2B segment.

Status and market development differ from country to country.

Figure 15: B2C: Estimated market penetration 2017 per country



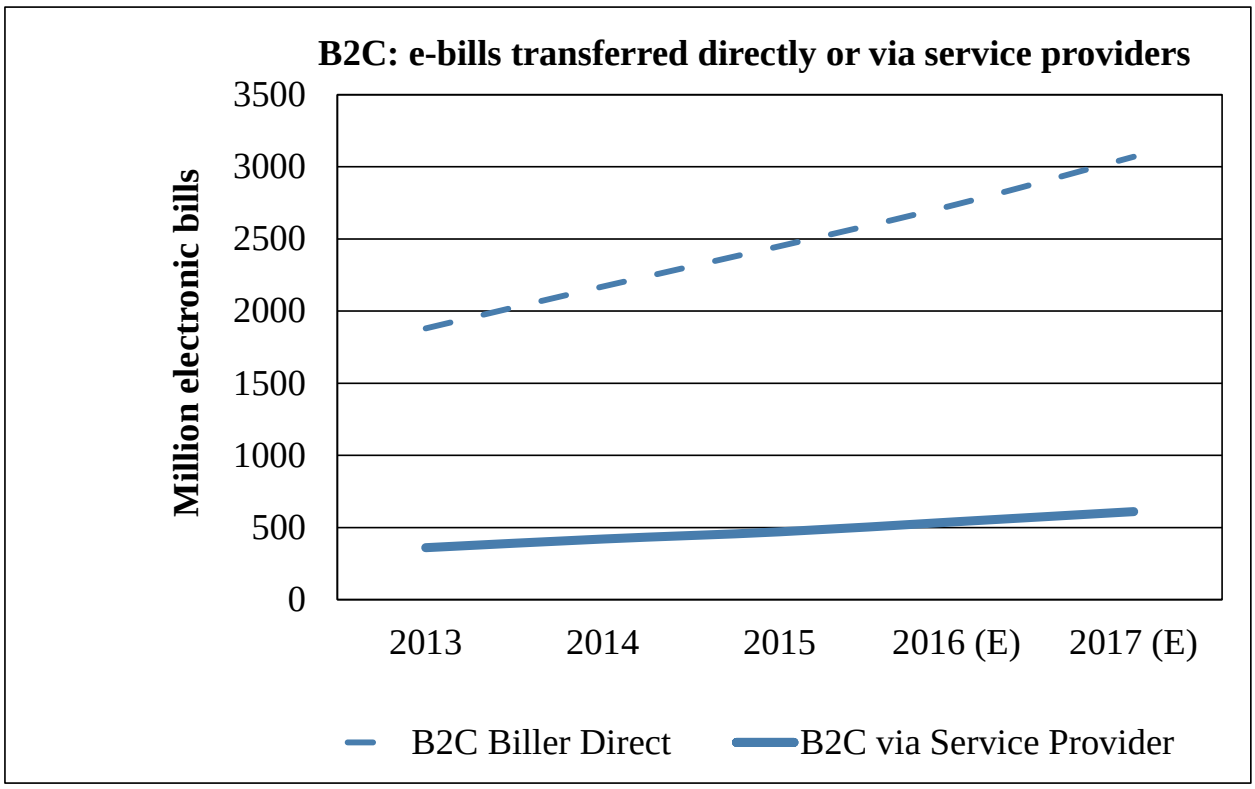
2.4.3.2 Transition from large innovators to mass market

Most large billers have meanwhile an acceptance of 25-90% for e-bills with a majority of around 35-50% of their customer base. The few available surveys confirm that still mainly younger consumers use e-billing. Obviously a paradigm shift, a new approach and some more years are needed to achieve the mass market.

2.4.3.3 Distribution channels

Most consumers prefer to receive electronic bills via email. Email is still gaining ground in many larger countries and could be the preferred delivery channel for 2/3 of European consumers in the mid-term. Bill presentment on the supplier portals and via internet banking does not yet play a major role in most European countries. An exception build the Nordic countries, where the exchanged e-bill volume via online banking portals is almost as high as the one distributed by other channels.

Figure 16: Electronic bill volume B2C, direct and via Service Provider



Source: Billentis

2.4.4 Supporting initiatives

2.4.4.1 Overview

The private industry is typically the catalyst for almost all digitalisation and automation projects. Although the solution providers are in competition with each other, as well as often the users in specific industries, they frequently build supportive initiatives and associations with the aim to standardise and promote the new technologies. Classic examples include OASIS, UN/CEFACT, GS1, CEN, EESPA (European E-Invoicing Service Providers Association), OpenPEPPOL and many national or industry-specific organisations.

The public sector supports development through a variety of activities

- Considering the topics in the digital agenda and supporting it in various ways
- EU directives and implementation into national legislations
- E-Government Action Plan 2016-2020
- Launching/supporting standardisation initiatives
- Mandating public administrations to prepare their systems and processes for e-invoicing and e-procurement
- Promoting or mandating its suppliers to communicate exclusively by electronic means

2.4.4.2 Standards

In many cases, standardisation initiatives have failed to convince stakeholders to use them. A lack of information about existing standards combined with the pride of some introverted organisations has resulted in the re-invention of dozens of niche standards (domestic or industry focus) even during the last years. They can probably only survive if they build a subset of one of the most popular global standards (Oasis UBL, UN/CEFACT) or if they are based at least on the same standard model.

An estimated 10,000 ERP and accounting solutions are used in Europe. Integrating various e-invoicing standards is outside the scope of the ERP providers. That is why many e-invoicing network operators offer any-to-any-data-formatting services. Besides legal challenges and the networking idea, these formatting services are another main reasons that third party providers play a major role in e-invoicing in most countries. As a result, issuers and recipients of invoices using such services are independent of any standards and they have no longer to wait for a market dominant standard.

Some global and industry independent standards for invoices and directly related pre- and post-processes are:

Figure 17: Global and industry independent standards for invoices and business messages

Standard	Description
ebXML	ebXML (Electronic Business using eXtensible Mark-up Language), is a modular suite of specifications that enables businesses of any size and in any geographical location to conduct business over the Internet. Using ebXML, companies have a standard method for exchanging business messages, conduct trading relationships, communicate data in common terms, define, and register business processes.
OASIS UBL 2.x ISO/IEC 19845:2015	UBL, the Universal Business Language, is the product of an international effort to define a royalty-free library of standard electronic XML business documents such as purchase orders and invoices. UBL v2.1 has now been approved for release as ISO/IEC 19845:2015 Standard. UBL provides the standards for the PEPPOL (Pan European eProcurement Online) platform and public procurement initiatives in several countries.
UN/CEFACT	UN/CEFACT, a United Nations body, has a global remit. It encourages close collaboration between governments and private business to secure inter-operability for the exchange of information between the public and private sector. It has developed: • The UN Layout Key for Trade Documents, which is the foundation for the EU's Single Administrative Document (SAD) • UN/EDIFACT, the international standard for electronic data interchange • numerous trade facilitation recommendations and • UN/CEFACT XML
PDF/A-3 ISO 19005-3	PDF/A is an ISO-standardized version of the Portable Document Format (PDF) specialized for the digital preservation of electronic documents. PDF/A differs from PDF by omitting features ill-suited to long-term archiving. This is a key requirement for business documents which have legally be archived in long-term. PDF/A-3 adds a single and highly significant feature to its predecessor PDF/A-2 (ISO 19005-2) specification, to permit the embedding within a PDF/A file a file, or files, in any other format and of any type, e.g. XML files. Germany and France jointly developed a common e-invoice format based on the PDF/A-3 approach with embedded XML data. It is conform to the requirements of the EU Directive.

CEN/PC 434	The Directive 2014/55/EU requires the development of a European standard for e-invoicing in public procurement with the aim of removing cross-border barriers. The deliverables of the project group will include a European standard on the semantic data model for the core elements of an electronic invoice, a technical specification on a limited number of invoice syntaxes and other components. Two syntax formats approved by CEN are UBL and UN/CEFACT. The standard will be transposed to Member State level and is intended to be supported by all EU public administrations. The core invoice is also intended for B2B use.
CEN/PC 440	The main objective of the committee will be to develop standards to support and facilitate the electronic public procurement processes and their underlying accompanying information flows in the physical and financial supply chain (for all other document exchanges in electronic public procurement). The committee will work in close collaboration with the CEN Project Committee on Electronic Invoicing (CEN/PC 434).

Industry specific standards are

- ETIS: Telecom invoices
- GS1: EANCOM, GS1 XML and GS1 UN/XML standard mainly for various sectors including retail
- ISO 20022: Financial industry
- LITIG/LEDES: Law firms
- PIDX: Oil and Gas Industry
- Rosetta Net: vehicle manufacturers

Some country specific standards are

- Austria: ebInterface
- Belgium: BMF
- Czech Republic: ISDOC (based on UBL)
- Denmark: OIOXML (based on UBL)
- Finland: Finvoice
- Germany: ZUGFeRD
- Italy: BTW, FatturaPA
- Spain: facturae
- Sweden: Svefaktura, SFTI
- Switzerland: swissDIGIN
- Turkey: UBL-TR (based on UBL)

2.4.4.3 Impact of new government initiatives

Almost every quarter, we read in the press that another country declares e-invoicing as compulsory. Often, these press releases are translated from the national language into English, and they do not always mean the same thing. This has to do with different usage of the terms “e invoicing” and “mandate”, and there is a big discrepancy between intentions and reality. Such projects in a public sector environment are quite complex. Objectives within a state’s administration may

already vary broadly. In addition, we have many federal states with great autonomy of local authorities.

The common denominator is usually that an announcement making e-invoicing mandatory includes preparing all departments of a central state's government to upgrade their systems and processes with the aim of receiving and/or issuing e-invoices. Municipalities are typically in an observer role and do not necessarily act, but they are encouraged to do so. The suppliers are still free to exchange invoices with the public sector in paper or electronic form.

In a second step, suppliers (or at least larger ones) are mandated to send the B2G invoices electronically. Denmark is a pioneer in this segment (obligation since 2005). Austria, Finland, Italy, Norway, Slovenia, Spain and Switzerland belong to the early adopters.

Some countries in Latin America, Asia and Europe mandate businesses to report electronic invoice data to the tax authorities mainly for reasons of validation and/or calculating taxes. This is increasingly combined with real e-invoicing between suppliers and buyers.

From the end of 2018 or in 2019, Public Administrations (PAs) in EU member states will be obligated to support a certain e-invoicing standard and to develop the ability to carry out automated processing of electronic invoices. In addition, they have to migrate certain procurement processes towards electronic procedures. The schedule is quite tight for the PAs affected. This means that most of them are starting their projects now. They are developing strategies with the aim to achieve broad-scale market adoption rates for electronic processes. The directives shall increase the proportion of electronic invoices and pave the way for cross-border interoperability.

We estimate that the new directives will affect 300,000+ public administrations / agencies in Europe. They have to enable their systems and processes with the aim to receive and process invoices electronically.

This step paves the way for a broad-scale market adoption. Several countries are also expected to declare a mandate for Business-to-Government electronic invoicing in addition.

Government e-invoicing initiatives are certainly not limited to Europe. More than 50 countries around the world are pushing e-invoicing and other paperless processes.

3. Significant market transition lies ahead

3.1 Catalysts for a new era

A powerful market transition and transformation is taking place in our industry. This period of movement from one stage to another creates new opportunities for innovative and forward-thinking companies, which are ready to take advantage of this shift.

In view of the rapidly changing environment, we believe that these topics are in the foreground as market accelerators and game changers for the three years ahead of us:

- The regulators are increasingly fighting the VAT gap[3]. Many new government initiatives resulting in B2B and B2G e-invoicing, e-reporting, e-filing, e-auditing, and compliance requirements are prompting almost all organisations to act.
- The business models and IT systems of most organisations have evolved in times characterised by the use of paper-based processes. Businesses are required to become more agile. They are required to replace their traditional models with disruptive innovations, and to re-engineer their processes.
- Pure e-invoicing services are no longer sufficient. The demand to support additional documents, processes, and value-added services is increasing substantially.
- A paradigm shift regarding the way to collaborate between different stakeholders is in progress.
- New emerging technologies are more mature, and are ready to be used in practise.

3.2 Regulatory requirements catapult market into new dimension

3.2.1 VAT gap as main accelerator for the digitalisation of all fiscal documents

The private industry was the main driver for the market development in phase one; however, it is now being increasingly supported by the governments. The VAT gap becomes more and more the main accelerator for the digitalisation of any business, fiscal, reporting, inventory, trade, and logistic documents.

To understand the development of e-invoicing in general, and the influence of the governments in particular, it may be helpful to understand the impact of the VAT gap.

Globally, the VAT Gap may be 20-30% of the public revenue, or about 500bn EUR p.a. [20]. The fight of tax authorities against this VAT gap has become a major trigger for the digitalisation of most business and tax processes. Before going into details, is it crucial to understand the areas where the VAT gap may occur, and the digital vehicles with the potential to reduce this gap.

Figure 18: Some causes of VAT gap and the digital vehicles to reduce it

Area / Cause	Digital vehicle
Cash payments without receipts and tax declaration	Require non-cash payments above a certain amount and/or withdraw banknotes from circulation if they exceed a certain amount. Require certified cash registers that are linked to the tax authorities to submit real-time reporting. Encourage or require customers to demand receipts / invoices.

[3] Difference between the amount of VAT actually collected and the VAT Total Tax Liability

Area / Cause	Digital vehicle
	Apply the clearance model.
Carousel fraud and invoicing between phantom partners, or involved parties winding up before tax audit	Require e-invoicing. Require real-time lookup routines to make sure that all trading parties are registered in the national business directory. Apply the clearance model.
No invoicing or invoicing using wrong amounts	Require e-invoicing via clerance model.
Goods are not supplied after an invoice has been issued	For physical supplies: Digital link between the virtual and physical world; transport documents shall be valid only with evidence that transported goods have been declared with the tax authorities. Digital inventory reporting between businesses and tax authorities.
Smuggling and domestic fraud with physical supplies	E-customs; digital trade facilitation; digital link between the virtual and physical world.
Fictive employees and salaries	Require electronic salary statements, which are exchanged using the clearance model.

3.2.2 Electronic reporting of invoice data and other fiscal information

Governments' revenue departments combat tax evasion wherever they can. They seek to gather vast amounts of data regarding all relevant issues – following the concept of Big Data. Today, the status quo in all countries is to collect at least general ledgers and other audit data. In most countries, this is still only required periodically, after transactions have already occurred, and paper-based reporting is in most cases still permitted. This likely has no real influence on reducing tax evasion. Big Data may become the new gold to combat the tax evasion.

Considering all fiscal documents, it is the invoice which provides the most complete information for tax authorities. Invoices are therefore moved to the foreground as part of a next transformation step. In this phase, tax authorities mandate the organisations in a country to exchange invoices in electronic format only. The invoice data also have to be sent to the tax authorities (clearance model) before or after the shipment of goods. E-audit and data forensics help the tax authorities to detect anomalies sooner. As we see in a number of countries, these steps significantly facilitate a reduction in tax evasion.

Nevertheless, tax evasion is still possible, for instance, if goods are sold over the counter, or if paid salaries are declared wrongly or not declared at all etc. Consequently, countries that in particular exhibit a level of tax evasion above the international average are currently attempting to completely close the electronic loop between tax payers and the tax authorities. All data of fiscal relevance will be reported to the tax authorities electronically in the future. Real-time or near real-time audits will become a matter of course.

This concerns several fiscal documents, which are increasingly required to be exchanged with tax authorities, trading partners and employees in an electronic format only, including:

- Invoices
- Bill of lading or delivery note, to ensure that a supply follows an invoice (such as Brazil)
- Goods received notes (such as Manifestacao do Destinatario in Brazil)

- Payment slips to cover revenues made over the counter (fiscal document issued by tills at the point of sale)
- Export/import, trade facilitation documents
- VAT declarations
- VAT deduction documents
- Salary statements (such as in Mexico)
- Bank statements (such as in Mexico)
- …

As the electronic gaps from the taxation perspective will be closed, tax declarations, deductions and the traditional audits will no longer be required in the future.

The results for the tax authorities are remarkable:

- Brazil has seen a $ 58 billion (USD) increase in tax revenue as a result of plugging gaps in invoicing and reporting.
- Mexico increased tax collections by 34% in the first wave of its e-invoicing rollout, before mandates on reporting even went into effect.
- Colombia found that it could reduce 50% of the country's tax evasion by applying these forms of models.

To achieve this, it is necessary to completely disrupt the conventional paper-based models. Not all countries have this capability or the political support for the strict replacement of traditional models.

Most countries in Latin America, as well as some countries in Asia are forerunners with respect to the digital reporting model. Southern and Eastern European countries are now following this trend, although they use different models. Spain is one of the countries that require reporting of invoice data not only from suppliers, but also from buyers.

3.2.3 Digital link between virtual and real world

Documents and information related to the transport, delivery, customs, and even manufacturing of goods are directly related to the fiscal documents as mentioned in the chapter above. Therefore, are they expected to become a mandatory part of electronic reporting in the future.

In many countries, solutions already exist; however, most of them work with just a fraction of data, or they are isolated systems that do not match information between the virtual and the physical world.

In the **EU**, the Excise Movement and Control System (EMCS) is in place. Under EU legislation, excise duties are paid on alcohol, tobacco and energy products at the final point of consumption. While in transit to their final destination, these goods are in duty-suspension i.e. no excise duty has yet been paid on them. The EMCS provides Member States with an electronic system to monitor the movement of these goods in real-time, in order to ensure that the duties are properly levied at the final destination. [21]

Brazil is already quite advanced. The tax authority requires that invoices are issued before goods are shipped. Brazilian tax authorities send the signed invoice / bill of lading back to the supplier, and ensure that goods are supplied following invoicing. In addition, the system Brasil-ID [22] allows tracking goods on certain corridors, based on the RFID technology.

Hungary operates the Electronic Trade and Transport Control System EKAER [23]. The system is designed to minimize the possibility of VAT fraud, and has been in place since 2015. It monitors transport of goods inside Hungary, and also goods transported on public roads between member states of the European Union. Hungary is also making a big step forward regarding electronic reporting of invoices. Hence, the tax authority will eventually have real-time data about the virtual and physical world.

It may surprise the readers, that we mention **Kazakhstan** in this text. Institutional reforms of the President of Kazakhstan have resulted in a long list of step-by-step implementation action plan. One part of it builds the clearance system for many fiscal documents, including e-invoices, that is already up and running. The government has other ambitious plans regarding this project. As a next step, a Virtual Warehouse Module will be developed for end-to-end monitoring of goods from the moment of their import into the Republic of Kazakhstan, or their production on the RK territory, to the moment they are sold. The virtual warehouse will also make it possible to track the process of pricing at each stage of goods movement, from production or import to sale.
E-invoice exchange will require mechanisms of cross-border e-invoice exchange, in transactions with Eurasian Economic Union member countries and with other states. [24]

The new module will be integrated with related information systems. Therefore, it may become a very interesting example of a digital link between the virtual and the physical world. It is still unknown to us which technology will be used for tracking of goods, and connecting to the virtual world, but we assume that the “Internet of Things” and perhaps the blockchain technology could play a key role in this process.

3.3 Private industry evolution

3.3.1 Trends to increase business agility

In today’s erratic economy, business agility is more important than ever before. According to the concept of business agility, organisations seek to approach their operations and resources in a flexible manner. The concept also concerns the ability to rapidly adapt to market and environmental changes in a productive and cost-effective way. Next-generation technologies lay a strong foundation as strategic drivers. Cloud computing allows scalability and adjustable costs per transaction, while mobile devices enable employees to work more easily away from traditional office environments, as well as providing a new form of interaction between people and machines.

Today’s business models evolved during decades which focused on conventional paper processing. In the northern hemisphere, businesses and governments are typically taking a gradual approach to replacing this paper-based systems with digital substitutes. Small steps can only create incremental improvements. A number of Latin American and Asian countries are instead developing disruptive models that are optimised for a fully digital world on a broad scale. These developments on a national level also make sense on a company level. The time is right to critically question the use of traditional models and shift to disruptive technologies.
Some innovative organisations have already realised the need to change and are therefore replacing their existing solutions with next generation technology (see chapter “Emerging technologies”).

3.3.2 E-procurement and automation of business processes

Invoices are an important part of the entire procurement process. Many recurring invoices are the result of contracts without a termination date (e.g. leasing, phone, IT hosting, or maintenance). Several goods and services are ordered in a simplified form by phone, online, or by email. Formal and structured purchase orders (PO) in the proper sense are issued only in a small number of cases. Hence, we estimate that only 6-7% of all invoices are currently based on an existing PO.

Since invoices are issued for 100% of supplies, they are quite often the entry point for the digitalisation and automation. This approach is promising in case of horizontal markets (industry-independent). It is also appropriate for businesses of all sizes.

Large businesses, in particular well-established vertical industries and businesses in the Anglo-Saxon countries prefer to start the digitalisation with a real procurement process. The same evolution has taken place in some Nordic countries, and in Portugal.

In many countries, e-invoicing is much more visible on a broad scale than e-procurement. One reason for this is that e-invoicing was pushed by tax authorities around the world as a top priority and e-procurement was mainly an issue of the private industry. According to Eurostat [25], 17% of all businesses with ten or more employees in the EU received at least 1% of its orders electronically in 2015. Considering this statistic, Belgium, Croatia, the Czech Republic, Denmark, Germany, Iceland, Ireland, Norway, Portugal, Sweden and the United Kingdom are more advanced than average. Sweden maintains a nationwide index on the growth of e-invoices and e-orders. In Q2 2014, the ratio was 11.4 e-orders for every 100 e-invoices. The absolute growth rates of e-orders are clearly below the values achieved for e-invoices. [26]

3.3.3 Improve the data accuracy of tax-relevant documents

3.3.3.1 Brief analysis of challenges

Recipients particularly understand the problems of poor data quality in invoices. This starts with differences in the master data and other data fields mandatorily required by the tax legislation. Inaccurate invoice data result in expensive exception handling and payment delays.

As many businesses optimise taxes through illegal and legal methods, tax compliance is increasingly put into the spotlight. The OECD and G20 countries agreed to increase the requirements for reporting and the tax compliance of any business documents. The Panama papers scandal might further strengthen and accelerate this trend. Businesses have to provide more precise evidence that trading partners really exist and that business documents are based on a supply of goods or services. The current accuracy of invoices and related business documents may no longer be sufficient.

Invoice issuers and recipients also have tremendous costs associated with inaccurate invoices. This is well reflected in a survey. Atradius [27] analysed the main reasons for payment delays by domestic B2B customers. Incorrect information on invoices was the reason for 25.7% of these delays in Asia Pacific, 26.3% in the Americas and 15.1% in Europe. Even worse is the fact that in 19.2% of the cases in Asia Pacific, the invoice was sent to the wrong person. The value in the Americas was 21.4% and in Europe 11.6%.

Higher invoicing accuracy can be achieved by improving the address data of issuers and recipients, and all data related to the underlying supplies (goods and services).

Phantom trading partners (fictitious corporate entities) and supplies (never delivered) are also a main reason for AP fraud. According to a 2015 APN survey, 44% of organisations have been affected by fraud in the last three years [28]. According to the 2014 Report to the Nations on Occupational Fraud and Abuse, the typical organisation loses five percent of its revenues to fraud each year [29].

Not all, but many of these challenges can be overcome with an appropriate measure to improve data accuracy and validate the data on a real-time or near real-time basis. E-invoicing based on accurate data lays an excellent foundation to this end.

3.3.3.2 Accurate addresses and master data

Tax compliance requires that both trading partners really exist, and that their addresses are correct and in line with the entry in the business register.

Digital certificates can be one tool that may be used to unequivocally identify trading parties, at least on the technical authentication level. They are already in use in some countries with this objective. However, this unique identification does not necessarily guarantee that the issuer and recipient addresses on the invoice will correspond. This can rather be ensured by a synchronisation of the master data with accredited registers. Such accredited directories may be the national business registers. In addition, public sector registers – including the public administrations/agencies on all federal levels – may be established and maintained. The data of these directories are sometimes not yet fully public, mainly for privacy reasons. If this is the case, the legislation can be changed to pave the way for easy online access to them. For practical reasons, registers are required to support a number of specifications regarding hierarchies such as for headquarters and branches, subsidiaries etc. If these prerequisites are fulfilled, the market participants can use lookup routines to dynamically synchronise key parts of their master data in their ERP solutions or respectively the user directories of e-invoicing network operators. Australia might be one of the first countries going this way with dynamic lookup routines [4][5]. Some Nordic countries, Austria, Italy (public administrations) and a number of others are also quite advanced in this respect due to their use of public registers in the context of e-invoicing.

Direct data synchronisation between the systems of trading parties will still play an important role in many high volume industries, but might in the medium term be complemented or replaced by synchronisations with national registries.

Some projects are paving the way towards the identification of trading parties in the future, including for cross-border transactions. The EU has initiated eIDAS [30]. Mexico is also very active regarding unique cross-border identifiers for trading partners in Latin American countries, the US and Canada.

3.3.3.3 Accurate product and service information

Due to compliance requirements, businesses have to provide the evidence that business documents are based on a supply of goods or services. Tax optimisation by over-invoicing (fraudulently increasing the price of a good or service) or under-invoicing (decreasing the prices) shall thereby be avoided.

Businesses also have their own interests in accurate goods or service descriptions in invoices. For standard or mass goods and services, especially in regulated market segments, such data can be synchronised with a central data base. One example is TARMED, the tariff structure in the Swiss healthcare industry. The supplies in the invoices are matched with these standardised data. Most businesses are operating in a less standardised environment. For them, good options for increasing the accuracy of such invoice data are also available. Integrated purchase-to-pay solutions are leading to catalogue data matching.

The GS1 organization promotes GDSN (global data synchronization network), which enables trading partners to share product data globally.

We expect that data synchronisation services will play an increasingly important role in the future. However, at present most organisations prefer to issue orders predominantly by electronic means, and to receive e-invoices. In many cases, the content of these two documents can be automatically matched.

3.4 Emerging technologies

3.4.1 Current issues, and the need to act on the part of end-users and solution providers

In the invoice processing cycle, there is a high proportion of repetitive and time-consuming tasks, both for issuers and recipients. Nevertheless, more than 90% of all invoices worldwide are still processed manually. Of course, some invoices are scanned, and key data is extracted; some invoices are exchanged only electronically. Invoice data validation happens on the e-invoice exchange platforms and in some processing systems, mainly at invoice recipients. These tasks permit to reduce the proportion of manual exception handlings, typically to a rate of 20% or slightly below. Some third party service providers offer better values, but users complain that they have to pay high transaction fees. Many end-users would therefore prefer to bypass service providers. Considering the drive towards cost-effectiveness by third party providers, the ability to significantly reduce end-user prices is quite limited, except if the providers disrupt the old business model. Hence, the market is looking for emerging technologies to solve these issues.

The following is a brief assessment of some relevant topics:

- Blockchain
- Cloud Aggregation Platforms
- Robotic Process Automation
- Machine learning
- Advanced Analytics

3.4.2 Blockchain as the next game changer?

Many readers may be familiar with bitcoin. Not everyone may be aware that this was one of the first applications based on blockchain technology. This is now changing. Enthusiasts are convinced that this will be the new basis for many future solutions with the potential for killer-apps.

A blockchain is an open ledger, in which every transaction is recorded in a decentralized database (several nodes and computing platforms). Each block in the ledger records an executed transaction. The blockchain allows direct and secure transactions between parties in the same network, without the need for intervention by traditional intermediaries like payment service providers. Once information is recorded in the blockchain, it is considered immutable, because it is strongly protected.

Many major financial and technology organisations are exploring the benefits of blockchain, and some payment solutions that are based on it are already up and running. Many e-invoicing and B2B network operators have also launched proof of concepts. But is the e-invoicing industry comparable to the payment industry, or is the blockchain in this area rather a short-lived illusion? Is it a real game changer or something else?
Blockchain is used to solve problems that cannot be solved otherwise, or to solve problems significantly better and cheaper than is possible using other technologies.

The ideal application areas for blockchain include mainly the following scenarios:

- Many different involved parties
- Sequence of transactions/processes
- Other processing solutions are time-consuming and costly
- Security and integrity of transactions is important
- Irrevocability of transactions is important
- Trading parties prefer to exchange information on a peer-to-peer basis (bypassing the traditional intermediary service providers)

How well does the business process automation environment match the ideal environment in which blockchain can be used? It fully matches the items listed above.

However, there are further demands from market participants and regulators:

- Any-to-any data formatting and multi-channel support
- Tax compliance for domestic and cross-border invoices and business messages, both formal and in terms of content. This may include requirements regarding transparency of processes, location of processing, privacy for trading parties etc.

Our conclusions

- Good chance for e-invoicing related value-added services like payment, trade financing, contracts recording, pre- and post-processing of invoices on supplier/buyer side that is legally less demanding than e-invoicing, working capital optimization, etc.
- The blockchain technology may be also of relevance for new topics related to e-invoicing, and hybrid models that combine blockchain components with other technologies like tracking of shipments etc.
- The blockchain technology might have some chance in legally very liberal countries in North America, parts of Europe, Japan, and the Pacific region. It might be of particular interest for new market participants.
- The chance might be limited in Latin American and Asian countries that are already practising the clearance model. On one hand, service providers in these countries already have transaction prices in the low single-digit USD region while using their current model. This is just slightly higher than the public blockchain transaction fees. Last but not least, their systems have already been tested in the field, and are up and running.
- It is unlikely that the blockchain technology has the capacity to substitute up and running B2B networks and clearance models within the next five years. Rather it could complement them using a hybrid approach.

Analysts estimate that the global blockchain market size will grow from USD 210.2 Million in 2016 to USD 2,312.5 Million by 2021 [31] respectively to reach USD 7.74 billion by 2024 [32].

3.4.3 Cloud Aggregation Platforms

Organisations can meanwhile use different cloud services from various sources, e.g. ERP services, archiving, e-reporting of fiscal information, clouds to exchange business documents, and B2B networks. Organisations benefit from these cloud services by using and paying based on need. End-users acknowledge that they should not re-invent everything by themselves; instead, they should employ field-tested solutions and cloud services. Unfortunately, using different cloud services complicates aggregation, integration, customization, and maintenance. However, is it still difficult to find a single source for various cloud service requirements.

For about two decades, B2B cloud service operators have been trying to invent everything on their own at least for the business process automation. The result is quite often a relatively monolithic platform, which would not be very flexible, should a significant market transition take place. The low margin, in combination with steady demand from customers for new services and technological opportunities, may result in the implementation of new models. One method to improve the situation is to divide services/solutions into modular components, and to evolve towards a Cloud Aggregation Platform. The traditional operators with solutions based on the architecture from the previous decade may increasingly substitute their solutions with such platforms. New market participants may use them already at the start. They may become Cloud Services Brokers (CSB). A CSB aggregates hybrid cloud services from various sources, and creates a new bundled service for the customer [33].

We expect that many of today's solutions will be scrutinized, disrupted, divided into modular cloud components, and rebuild, based on the approach of a CSB. The new cloud is already visible on the horizon, building interesting opportunities for Cloud Aggregation Platforms.

Modular cloud components and open cloud services are already present on the market, e.g.:

- E-invoice exchange
- Any-to-any data formatting for at least the most common formats
- Mapping setups for data formatting and roaming, either provided as a cloud service, or by a shared service centre or independent cloud workers
- Tax compliance services
    - Validation services regarding tax compliant master data of issuer and recipient; lookup routines with public and private directories for businesses and public administrations
    - Validation services for other legally required invoice content
    - Ensuring and/or validating formal compliance of invoices and other business messages
    - Long-term archiving
- Synchronisation services for product data
- Software robots for specific tasks
- ERP in the cloud
- ERP connectivity services
- Country localization services
- Tax reporting
- Virtual server and data centre
- Open-source cloud computing services
- Web services
- Data base
- Data extracting
- Analytics, including spend management
- Payment and Supply Chain Financing
- Procurement
- Trade facilitation

Associations such as EuroCloud [34] and others are also encouraging this development. As a result, we expect that the number of platforms featuring reliable cloud components (portals, shops, directories with catalogues of various cloud components) will increase. This will allow end-users and service providers to consolidate cloud services into one complete package.

Ideally, industry-specific associations would start an information market place for related cloud services around e-invoicing, e-procurement, financial supply chain and business process automation. This would increase transparency, and pave the way to re-use field-tested services.

This development is still in its early stages, but it may have the momentum to disrupt conventional models. By using these services, organisations will have the chance to become more flexible in the future.

Gartner and others identify three areas within which cloud service brokers operate.

Figure 19: Activity areas for Cloud Services Brokers

Area	Description
Aggregation	Management and administration tasks, including provisioning, user access and authentication, monitoring SLAs etc. for different cloud services, which are provided by multiple cloud service operators. Providers also develop a unified interface to all these services.
Integration	Integration ensures that the different cloud services communicate and work properly with each other.
Customization	System configuration to meet the requirements of the specific operating environment.

We anticipate new opportunities for B2B cloud operators. On the one hand, they might substantially improve their cost structure and flexibility by using modular cloud components. Another opportunity might arise if they offer parts or the entire cloud service to current Cloud Service Brokers. Last but not least, they could enhance their existing portfolio with further cloud components, and could become Cloud Service Brokers themselves.

The estimates of MarketsandMarkets Research [31] are very promising. They predict that the cloud services brokerage and enablement market will grow from USD 7.44 Billion in 2016 to USD 26.71 Billion by 2021, at an estimated CAGR of 29.1% from 2016 to 2021. According to the Transparency Market Research [35], the global cloud service brokerage market was worth US$3.3 Billion in 2015, and is expected to reach US$22.4 Billion by the end of 2024.

3.4.4 Robotic Process Automation

Academic studies [36][37] predict that Robotic Process Automation (RPA) might start a new wave of efficiency gains. Oxford University [36] speculates that many jobs in the area of invoice processing may become automated by 2035, especially New Accounts Clerks, Data Entry Keyers, Order Clerks, Procurement Clerks, Claims Adjusters, Examiners and Investigators, Bookkeeping, Accounting, Auditing Clerks, Credit Authorizers, Checkers, Billing and Posting Clerks, Surveying and Mapping Technicians, Bill and Account Collectors, Accountants, and Auditors.

The common feature of all these positions is a high proportion of repetitive work in the area of invoice processing.

RPA solutions automate repetitive and rule-based processes, which are usually performed by humans. The tools or robots replicate the actions of a human, interacting with the user interface of a computer system. For example, entering data into an accounting system would be a typical activity for software robots. They are configured or “trained” using demonstrative steps, rather than programmed using code-based instructions. Robots can login to relevant legacy systems (role-based directory authorization), and to work as virtual workforce. They are also able to collect data from various input sources, such as files or VAT business and public administration registers for master data synchronisation. They can interpret data, perform all the necessary validations, including crosschecking against other systems and messages, and feed this data into the target systems. When they encounter process exceptions, they can either rule them out or transfer them to a cognitive agent which will make a decision, update the system, and complete the process.

About 50% of back-office processes are expected to be substituted by RPA solutions in the coming years. Depending on their strategy, Business Process Outsourcing providers face both an opportunity and a threat.

The global RPA market is expected to achieve a size of USD 8.75 billion by 2024 [32], resulting in grow at a CAGR of over 60% from 2016 to 2024.

Implementation of RPA already brings significant benefits. Furthermore, it is fast to configure and to implement without disrupting the existing systems. It is appropriate for many of today's business processes that run according to rigid rules. Often, these processes involve highly repetitive work, such as processing invoices. Nevertheless, much of the remaining saving potential cannot be exploited only by using RPA.

3.4.5 Machine learning

Many organizations have to deal with judgement-based, complex processes and problem-solving. Consequently, cognitive robots are required. This is where Artificial Intelligence and Machine Learning as an application of it come into play. It is based around the idea that we should be able to give machines access to data, and let them learn for themselves. Machines learn directly from both structured and unstructured data, recognize patterns, and build their own business rules using learning algorithms. With this approach, business systems will reach a new level of intelligence and efficiency. Machines learn from what they have done in the past, improve performance based on experience, and are able to infer solutions.

Organizations may benefit from machine learning in numerous ways. They will be able to accelerate and optimize their business processes in general, and invoice processing in particular. Machine learning may simplify user interactions with devices, reduce human intervention, support fraud detection, forecasting liquidity, dynamic pricing, customer complaint resolution, trading partner scoring, and spend management.

An analyst [31] predicts that Machine Learning as a Service Market will grow from USD 613.4 Million in 2016 to USD 3,755 Million by 2021, at a Compound Annual Growth Rate (CAGR) of 43.7% from 2016 to 2021.

3.4.6 Advanced Analytics

Businesses are steadily required to be more customer-focussed, to focus on key initiatives that lead to entering new markets, to create new business models, and to improve operational performance. These are key factors driving advanced analytics, big data, and business intelligence investments today. This also concerns the finance and procurement departments.

Dashboards and reports are quite often the first steps towards more transparency; however, advanced analytics goes far beyond this. Gartner estimates that the business intelligence and analytics market is mature for a multiyear shift from an IT-led, system-of-record reporting to a business-led, self-service analytics. The reasons for this positive shift are multi-layered. End-users and business networks have learned to use big data in an intelligent manner. This is strongly supported by models, algorithms, and solutions that have not been available in this form only five years ago. Last but not least, less expensive computer power helps to accelerate this trend.

The list of applications on offer is rapidly increasing, and includes a broad range of features, from basic to very advanced.

- Invoice content
    - Anomalies, e.g. items higher than the normal price, or price differences between identical products

  - Incorrect tax allocations
  - Tax compliance
  - Contract and policy compliance
- Real-time spend analysis
  - Intelligently classified with drill-down options
  - Price fluctuations
  - Real-time and historical price variance analysis
- Benchmarking, comparison with the industry average
  - Payment terms
  - DPO, DSO
  - Early payment discount rates
- Business trends and predictive analytics
- Detecting and avoiding fraudulent invoices

B2B networks for the financial supply chain operate using big amounts of data. They are in an excellent position to help end-users to apply advanced analytics in an efficient manner. Forbes predicts that cloud based big data and analytics market will grow 4.5x faster than spending for On-Premises Solutions.

According to an analyst [38], the entire global advanced analytics market was valued at around USD 10.70 billion in 2015, and is expected to reach approximately USD 60.44 billion in 2021.

3.5 Improvement from pure transactions towards measurable values

Before the turn of the century, there were less than 15 specialised e-invoicing service providers worldwide. In the early days, network operators were typically able to serve only their domestic markets in a tax compliant manner. Soon may the number of e-invoicing network operators reach 1500. Many of them are meanwhile required to support formatting wide range of data formats, and to process several business and fiscal messages. The fees the network operators charge to customers today typically include initial, time-based and transaction based fees. Usually, they charge these fees regardless if the customers get very accurate and structured invoice data, or data of poor quality. Fortunately, the progress done during the previous years is impressive. The geographic coverage of network operators is steadily increasing. The quality of services is also rapidly improving, and we benefit from an increasing number of value-added services. Nevertheless, this might not be sufficient in the future.

We can see first signs of a paradigm shift. Some providers, most of them based in the US, are addressing the market with a new approach. They do not only sell technology, or help with implementation and transactions; instead, they promise quantifiable added value. They promise to deliver customer solutions that will bring measurable improvements. This is particularly interesting for the automation of business processes and spend management.

Examples of quantifiable measures and outcomes:
- Amount of savings
- Proportion of straight-through invoice processing
- Proportion of exception handlings
- Proportion of tax compliant invoices
- Proportion of contract compliant invoices
- Number of trading partners that have been on boarded within a defined time-frame; guarantee for a certain proportion of e-invoices after a defined time period
- Exploited early payment discounts
- Benchmark against the best in class or industry average

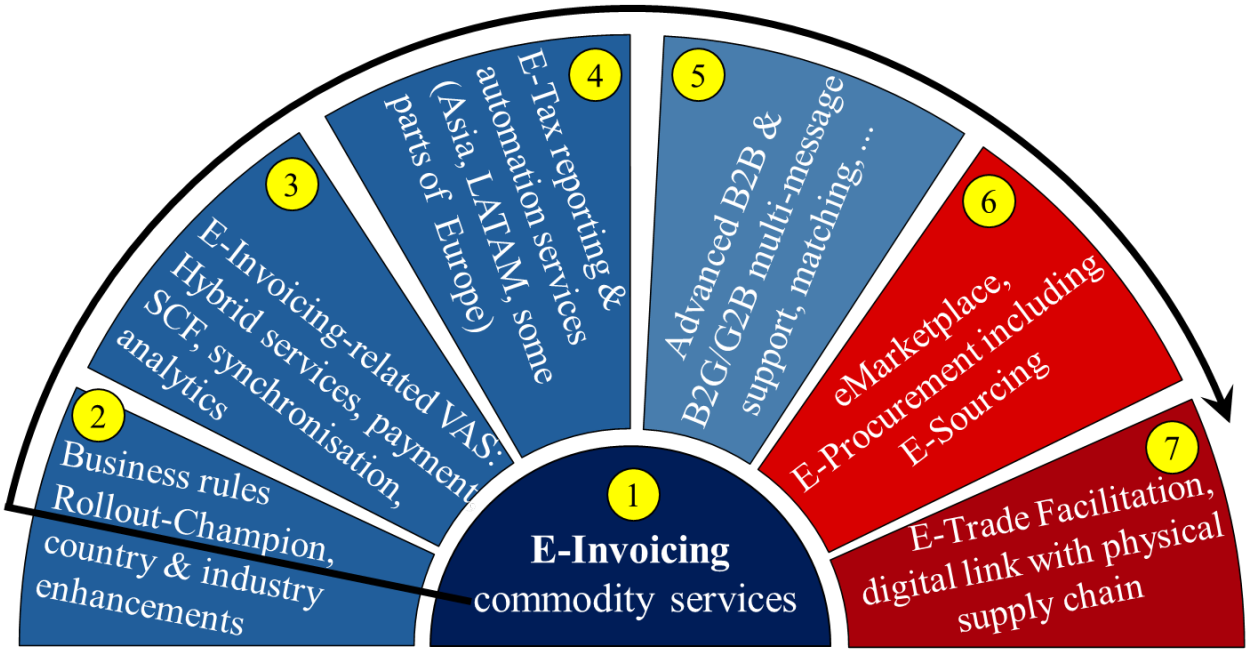
Consequently, the target achievement is combined with a chance/risk sharing model between the provider and the customer.

3.6 Solution providers challenged by diversified demand

Even for larger businesses it is often too difficult to comply with the rapidly changing requirements using in-house solutions. Therefore, it is even more important to involve third-party solutions and service providers to support them through this transition phase.

Specialised solution providers are experienced in this area and they have the business focus to handle this level of complexity. Nevertheless, it is also quite challenging for them to support their customers through the transition phase. The competition between solution providers is now quite tough. Customer-oriented offerings and innovations are in demand more than ever. A suitable and affordable long-term strategy for managing future business may become a key issue for these service providers.

Figure 20: Future Markets Radar for Service Providers – Future Management



Phase	Description
1	The commodity service could include any-to-any data formatting, tax compliant e-invoice preparation (domestic and cross-border), transport/distribution and archiving. Cost leadership is required for being competitive in the future. Providers unable to increase the processed invoice volume above the market average growth should think about mergers with competitors for achieving the critical mass. Evolve towards a Cloud Service Broker is an alternative.
2	We expect that in the provider community the “wheat will be separated from the chaff” based on the capacity to be a champion in these disciplines: Specific business rules are applied at least for validating the mandatory data fields in invoices. Data accuracy is a cornerstone for significantly reducing the costly exception handling of invoices. Electronic invoices can become the catalyst for this improvement.

Phase	Description
	A few service providers have developed excellence to engage and on-board a high number of users in a short time. In just a few years, the most attractive market segments in advanced countries might be occupied. In today's globalized world it is no longer sufficient to support just the domestic requirements. Country- and even industry-specific enhancements should also be supported.
3	Value Added Services (VAS) are increasingly an important differentiator to other competitors. In the spotlight today are hybrid services (processing of paper and electronic invoices in parallel), instant payment features, any kind of Supply Chain Financing & Trade Financing, Dynamic Discounting, data synchronisation services (master data, product data), analysis of invoice, processing and spend related data.
4	The tax authorities are increasingly demanding with regards to the reporting of any tax documents in electronic format. In the past this was often limited to general ledgers and VAT declarations. Increasingly taxpayers are also requested to send electronic data of audit files, invoices, credit notes, debit notes and even the payment receipt data produced by fiscal printers at the point of sales. Service providers mainly acting in Latin America, Asia, South and Eastern Europe are affected by this development. The IT challenges for many taxpayers are too high and they prefer to involve a service provider doing this on behalf of them.
5	A pure focus on processing solely electronic invoices is no longer sufficient. Meanwhile, more than 50% of service providers offer also support for other related business messages (e.g. orders, order confirmations, statements). In a first step they transport such documents in an electronic envelope. Leading providers offer advance services like content validation and matching between the different messages. The most popular services are currently the matching between orders, invoices and delivery notes.
6	Traditional electronic marketplaces grow increasingly into the business area of e-invoicing networks and vice-versa.
7	Exporters and importers process many cross-border invoices, but also a high number of customs, trade and transport documents. These additional trade documents have a high degree of overlap with the commercial and tax invoice. Tax authorities and auditors increasingly demand documents approving supplies and customs documents. The first e-invoicing network operators enter into this area in order to offer a full e-document service to their customers (full service for exporters and importers). This development is still in its early stage but might gain momentum until the end of this decade. The next evolution step is already launched: The virtual and physical world are linked. A match between electronic documents of the financial supply chain and the tracking and tracing information of physical goods becomes reality.

3.7 Need to change from a reactive to a proactive approach

3.7.1 Organisations with the aim to automate business processes

According to a recent study by MIT Sloan and Capgemini, only fifteen percent of CEOs are executing a digital strategy, even though ninety percent agree that the digital economy will impact their industry. This confirms the personal experience of us that a majority of organisations do not have a strategy to implement e-invoicing and to automate the processes. Rather are they required by important trading partners or by the legislation to act. The result is typically a very heterogeneous solution, channel and format landscape. This is expensive to operate and maintain. It is in

most cases also inappropriate to optimise processes in a holistic manner. This negative scenario can be avoided by defining an e-invoicing or better a holistic business process automation strategy as soon as possible.

Below is a list of questions, organisations should ask before defining a strategy:

- What are our objectives and priorities?
- Do we do business in countries that now or soon practise the clearance model for invoices, receipts, other fiscal documents or tax reporting?
- Do we do business in countries that now or soon practise a B2G e-invoice mandate?
- How can I ensure the tax compliance in an international environment?
- Do we want to automate just the invoice processes, include the purchasing, the entire procurement and even the sourcing process?
- Is it our intention to start with the order-to-cash or purchase-to-pay automation?
- Which corporate units, systems and processes will be affected by the project and how can former solutions be migrated?
- How shall B2B networks and other cloud services be considered?

3.7.2 Solution providers

Today the solution vendors have an extremely strong tendency to develop and operate almost everything by themselves. After taking a look at the profitability of the solution provider community is it obvious that most providers do not have the financial capacity and resources to develop and process all future services by themselves. Comparison: The automotive industry today has a depth of manufacture of 20-25% and still tries to reduce it. Specialized partners do the rest. In the end we expect and recommend a similar development of the e-invoicing and e-procurement solution provider community.

Disruptive innovations should not only be considered by end-users, but also by solution and service providers. The market ultimately demands a highly holistic solution, exceeding the capability of most solution vendors. Segmentation into specific functions that are provided by specialists to other service providers could become a realistic scenario. Finally, the potential innovation models for service providers are comparable to those of end-users. Define a strategy for the next 3-5 years, scrutinize what to do inhouse, what to do via partnerships and what components to reuse out of the cloud.

3.8 The time is right for the transition

The invoice processing with its' high proportion of repetitive and rule based work is a key topic to be affected by the market transition ahead of us. This phase can mean an opportunity or a threat.

The digital transformation is no longer an option, it's the imperative. It is rather the question how to unleash the power of the digitalisation while maintaining a healthy business.

4. How to be successful with your project

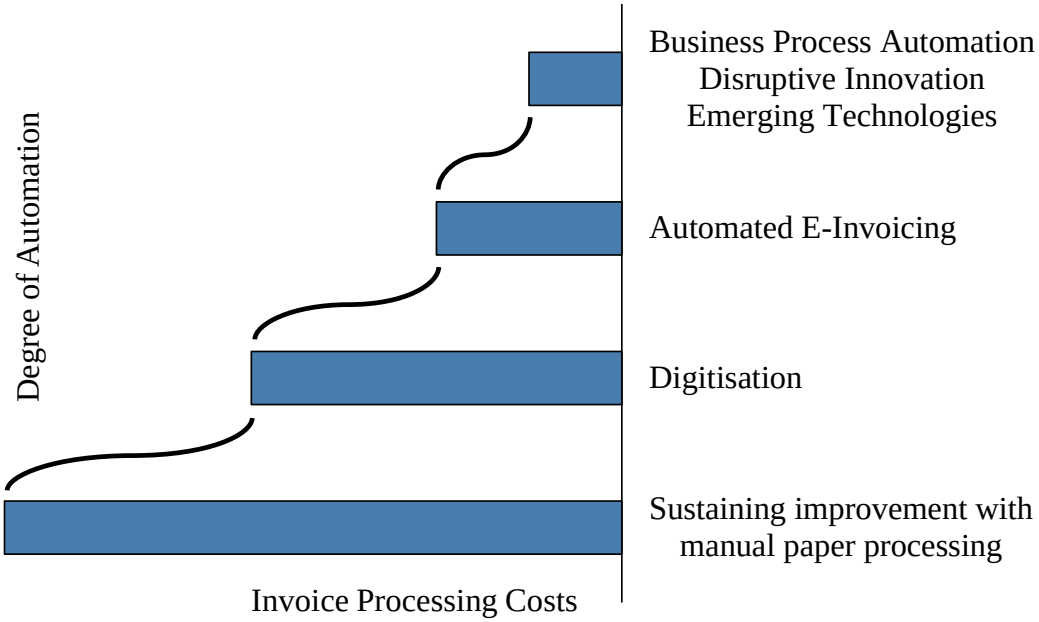
4.1 From gradual evolution to innovative business process automation

4.1.1 Evolution steps

Remark: In order to simplify the description, we focus on the invoice recipient side in this chapter. The steps for improvement are accordingly also valid for the invoice issuer side.

Organisations typically follow an evolutionary path and gradually improve their processes in 10-20% steps. Substantial savings are possible with this approach. Besides the introduction of these classic steps in this chapter, we will also encourage the readers to assess a more revolutionary model for business process automation based on disruptive innovation with the aim to improve to 90%.

Figure 21: From gradual evolution to innovative business process automation



4.1.2 Sustaining improvement with manual paper processing

In most organisations, conventional paper processing is not optimised. Invoices are often received decentrally by many departments. Cash managers do not have an overview of all invoices in the workflow and therefore only have limited opportunities to improve the working capital.

A first step of improvement is to centralise inbound invoices. From the very beginning, they can be processed more efficiently in a shared service centre. Offshoring such shared service centres can again reduce the processing costs substantially.

Nevertheless, the classic shortcomings caused by the paper format remain, such as:

- The accuracy of the invoice content remains a problem; typically 20-30% of all invoices have to be treated as exceptions in one form or another, resulting in very high processing costs.
- The data are validated and matched with related documents manually; this is time-consuming and costly. Delayed payments are often caused as invoice errors are detected very late during the processing cycle. Potential discounts are missed and the DPO stays too long.
- The master data have to be updated manually, resulting in high trading partner administration costs.

- For archiving paper invoices, a great deal of space is required. It is also costly to retrieve paper invoices in the event of audits or queries.
- The demand of trading partners for an electronic channel is not satisfied.
- Last but not least, paper invoices are harmful to the environment.

4.1.3 Digitisation

Digitisation is a huge step forward. Currently, two methods are in the foreground:

- Paper scan and capture
- Image-based PDF invoices

Digitisation requires organisations to establish invoice workflow and archiving solutions. As a consequence of this improvement, many disadvantages of conventional paper processing disappear, but several still remain:

- The accuracy of the invoice content remains a problem; typically 20-30% of all invoices have to be treated as exceptions in one form or another, resulting in very high processing costs.
- The master data can be updated on a semi-automatic basis, but the risk of redundancies of master data with minor differences could increase.
- The demand of trading partners for an electronic channel is not, or not fully, satisfied.
- Last but not least, paper invoices are harmful to the environment.

Image-based PDF invoices are for many organisations a first step towards paperless invoices. Invoice issuers favour these as they have an immediate positive impact on costs. Larger invoice receivers are more sceptical towards exclusively image-based digital invoices. Nevertheless, it is even an improvement for them compared to paper invoices. Transport is much faster. They have access to a quick, digital channel for feedback and rejects. For internal processing, recipients can feed the PDF invoices into the scan and capture process. The resulting data quality of this is slightly better than with paper invoices.

4.1.4 Automated e-invoicing

The legislation in many countries (in Europe, North America, Pacific etc.) considers paperless invoices in any electronic format to be e-invoices. This includes structured electronic invoices as well as image-based PDFs. Depending on the country, up to 50% of all businesses use office programs to generate invoices. They often neither have AR nor AP modules for their accounting. Many of them have outsourced invoice-related processes to third parties. For them, it is challenging to practically automate e-invoicing processes. For most others, however, a key objective is to fully automate these processes. Terms like ‘touchless e-invoicing’, ‘zero touch e-invoicing’, ‘true e-invoicing’ or ‘automated e-invoicing’ are used in this connection.

Suppliers and buyers use structured invoice data and typically establish direct two-way communication or increasingly use a service provider for the bilateral exchange. This results in many benefits.

E-invoicing is typically practiced in a centralised manner for all outbound and inbound invoices. This results in increased transparency and builds an excellent basis for the optimisation of cash management.

A major shortcoming of any paper and digital image-based approach is that the accuracy of invoice data is not guaranteed. With the appropriate approach, this problem can immediately be eliminated or at least improved (see chapter 3.4). The unique identification of trading partners

based on compliant master data is a prerequisite and becomes the norm for automated e-invoicing.

True e-invoicing paves the way for real-time or near real-time data validation. The earlier an incorrect invoice is rejected, the sooner a new one can be sent. As a result of the improved invoice accuracy, the approval and processing time can be reduced significantly. The DSO can in most cases be shortened by several days[4].

Dispute handling can be conducted in a more structured way by using the same electronic communication channel. As a result of the increased electronic interaction, the trading partner administration costs can be reduced substantially.

Compared to conventional paper invoice processing, the automated e-invoicing will result in cost savings of 60-80% in most cases.

Structured e-invoices build a good starting basis for value-added services and the easier implementation of trade financing services.

4.2 From the scratch to the rollout

4.2.1 Define the best Scope for your organisation

Many organisations already exchange some electronic messages along the supply chain with their counterparts. For them, e-invoicing is just an enhancement and a next step towards automating the whole supply chain.

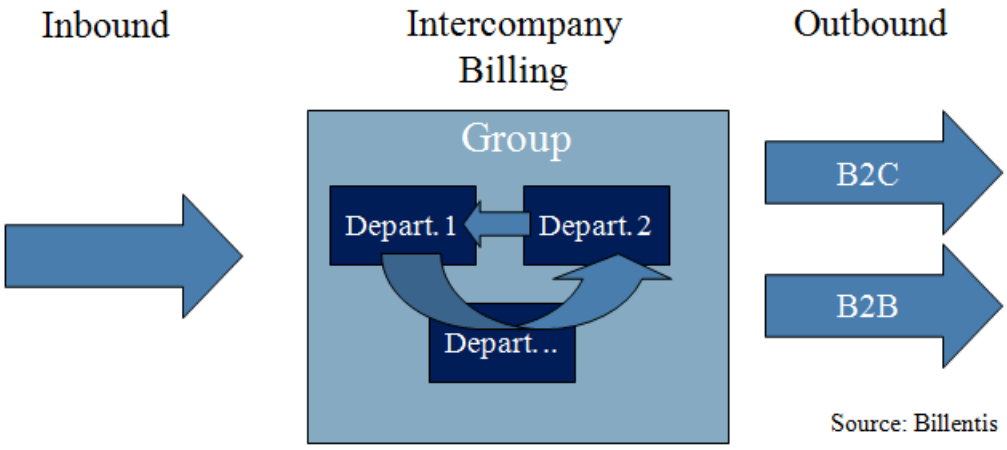
For a vast majority, e-invoicing is the first step towards the electronic supply chain. That is why many organisations start with the “queen of all messages”. In most cases, it is a good approach starting with “just” the invoice message and aggressively increases the electronic share within your environment. E-invoicing alone will already be an interesting business case! However, more future savings are possible with a fully automated supply chain.

In mid-term planning the next optimisation steps to take should be considered: Either in the pre- or post-processing of the electronic invoice.

Some invoice streams are more dominant and provide higher optimisation potential. We believe that projects should follow that potential.

[4] A survey in Germany confirmed 5.4 days for example.

Figure 22: Priorities of invoice streams



Inbound

Organisations in a strong buying position may decide to replace inbound invoices first, as they are in a strong position to push their suppliers to deliver invoices in electronic format.

Intercompany Billing

Volume and optimisation potential is quite often under-estimated. It is the only invoice stream fully under the control of each organisation. In one scenario, these invoices can quite easily be processed electronically or via account transfer. This is the case if all departments, branches or subsidiaries belong to the same tax entity in the same country. Wherever that is not the case, it can make sense to handle internal electronic invoices as for the external ones, with identical methods guaranteeing authenticity, integrity and legibility.

Outbound

High volume organisations in the B2C sector already provide electronic bills to consumers with direct models. However, the success is limited in most cases. If 50% of clients are using it, it is already a good value. Most send electronic bills just to 35-50% with best in class to 75-90%.

To increase the electronic share, an opt-out rollout model (as defined in figure 29) should be practised and/or networks should be distributed (e.g. online-banks or other favourite portals of consumers). Delivery of PDF invoices via email or portal has become very popular in many countries. However, many large billers made a more significant step forward by practising the push method rather than a portal based approach. The same is true for B2B invoices for small businesses. In this case, the PDF invoices are ideally much more than just a paper replica. Instead, the PDF files can include – alongside the invoice image – also a layer with structured (XML) data and the ability to include forms and components for dynamic interaction such as dispute, payment etc. e-invoices are prepared in a VAT compliant manner by the issuer (digital signature for at least relevant parts of the PDF container, verification and sometimes with long-term online archiving).

4.2.2 Know your environment

In many projects in larger organisations, it was interesting for the author to see the heterogeneity of customer environments, e.g.:

- High number of different ERP systems
- Decentralised issuing and/or receiving of invoices
- No control and overview regarding paper invoices in the workflow

- No transparency concerning all the invoice streams, volume and the different ways in which they are processed
- Various decentralised long-term archives
- Unclear as to which document is the invoice original and which is a copy
- Parallel and isolated projects in different departments for scanning, workflow, archiving, tax compliance and e-invoicing

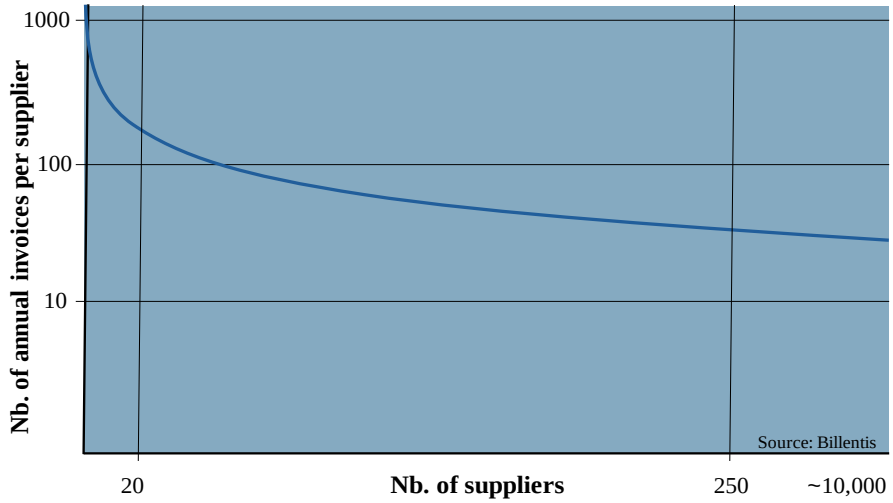
An efficient workflow and archive solution is in most cases another result of an e-invoice project. Cleansing of redundant and inaccurate master data before going into operation is strongly recommended.

If the reader is working in a large organisation, it is helpful to clarify the points above and summarise the current environment and the mid-term target environment.

4.2.3 Know the capabilities & constraints of your trading partner

Although valid in many sectors of our environment, the 80:20 rule is not applicable regarding invoice streams, except in very few industries. The pattern below for inbound invoices in a mid-sized or larger organization is much more likely.

Figure 23: Pattern for inbound invoices



The number of suppliers sending more than 100 invoices per year is quite often just among 20-50. Perhaps another 1,000 send 10-100 annual invoices and the vast majority send less than 10 annual invoices. Large organizations have typically 10,000 suppliers and depending on the product n0,000 customers. The vast majority of suppliers and customers are SMEs with highly fragmented IT landscape and limited capability for import/export of structured invoice content and electronic archiving. In addition, these counterparties can be located in various countries with different legal constraints regarding tax compliant invoices, archiving, language and cultural behaviour.

E-invoicing projects can just be successful, if the situation of trading partners is strongly considered in the project. This includes also thinking about what the incentives for them are and how they can easily be connected in a VAT compliant manner.

Whereas large issuers and recipients fully integrate electronic invoice processing into their environment, the requirements of mid-sized and small enterprises can be different.

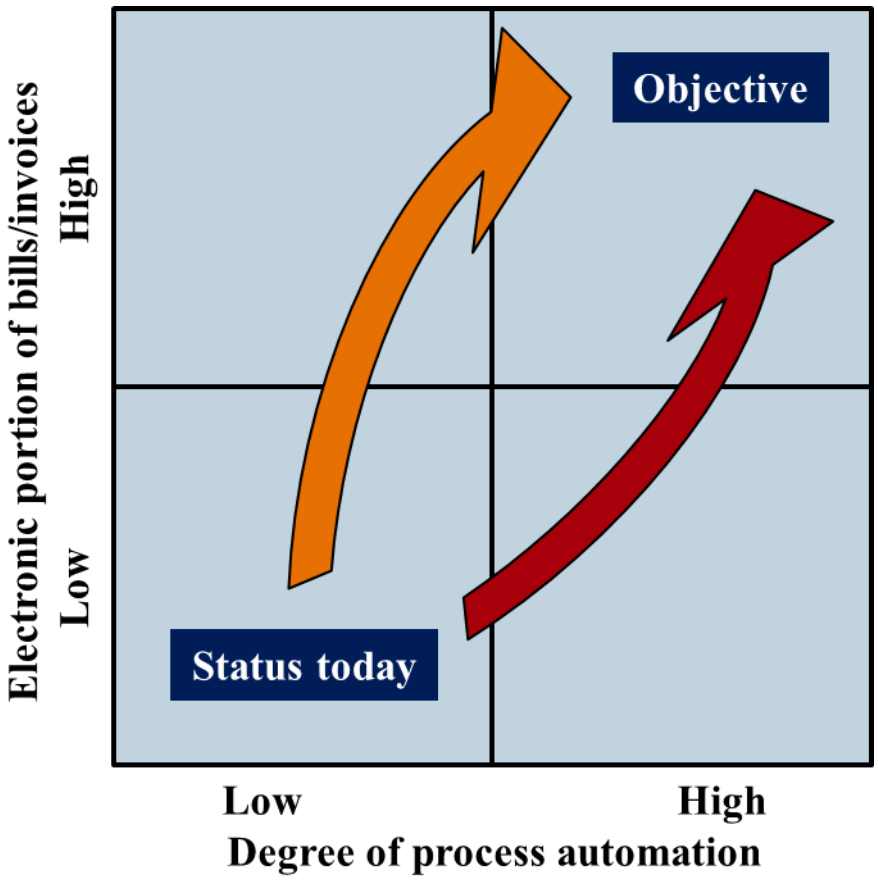
Figure 24: Requirements of organisations

Size	Issuer requirements	Recipient requirements
Large	• Full ERP integration • Two-way communication • Cloud archive (sometimes shifted to inhouse in step 2)	• Full ERP integration • Two-way communication • Cloud archive (sometimes shifted to inhouse in step 2)
Medium	• Full ERP integration • Export Tools (CSV, ...) • Cloud archive	• Full ERP integration • Import Tools (CSV, ...) • Cloud archive
Small	• Printer Driver • WebEDI (type in invoice on a portal) • Electronic forms • PDF (including several layers with image, XML data and other features) • Cloud archive	• Browser presentation & download, e.g. via home banking • PDF (including several layers with image, XML data and other features) • Cloud archive

4.2.4 Choose the appropriate migration strategy

This chapter focuses on the migration path options.

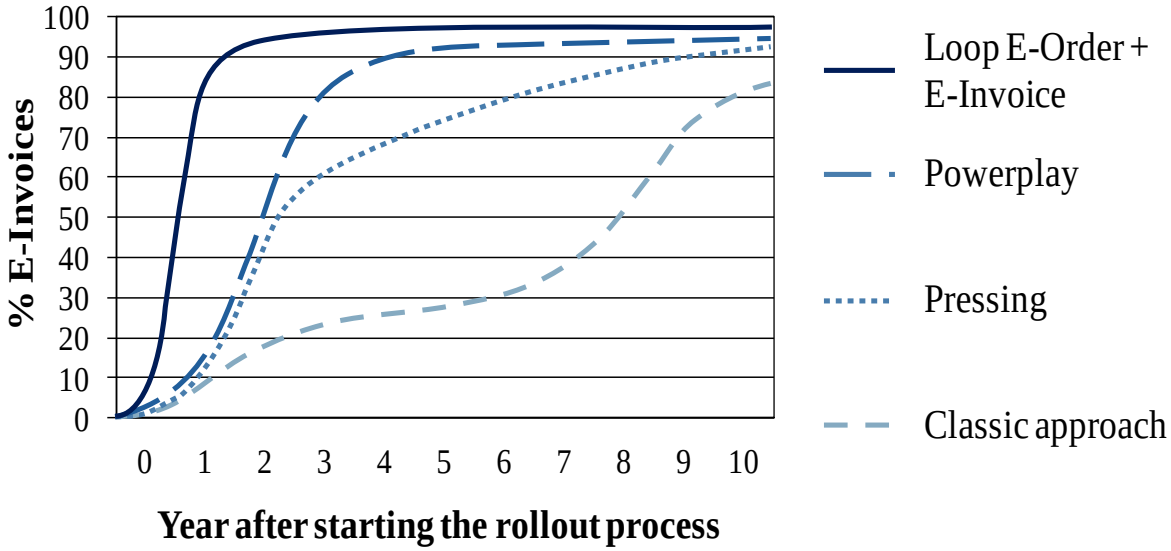
Figure 25: Migration path to exploit the full optimization potential



4.2.4.1 Increase electronic proportion

By monitoring the international markets for 20 years, we analysed the differing developments in organizations. The success rates and electronic proportions differ greatly.

Figure 26: Success rate dependant on practiced on-boarding methods



Phase	Description
Classic approach	Mainly large companies are innovators for e-invoicing. They push their larger trading partners to send and receive the invoices electronically. The Opt-In on-boarding method is practiced (convince one by one to enter into the electronic community). For the vast majority of organisations, the achievable share of e-invoices with large trading partners is just 25-30% after several years. In a next step, the large innovators also try to push their mid-sized and small trading partners to support electronic invoices. Even by increasing the marketing activities, a large organization does not have the power to make the market alone. They are dependent on the maturity of the mass market. The annual growth rates are limited. This market evolution was common in the past and is still in progress today in most countries. It did not cause a broad break-through in the markets up to today.
Pressing	For most large companies, it is possible to achieve an electronic invoice share of at least 60% after 3 years. This will not happen automatically with a smart and friendly approach towards trading partners. Instead, powerplay and marketing is necessary for increasing the share of e-invoices. In addition, the general contract terms should be enhanced to provide the contractual instrument to force trading partners towards e-invoicing. Although the rollout is strongly based on powerplay, this is still a fair method if the promoter or its service provider offers appropriate solutions for any kind and size of trading partner and for fair conditions. Registration and usage barriers shall be as low as possible. This can happen, for example, by taking the first step using only the internet. An account shall be pre-defined for each trading party

Phase	Description
	and can be activated with just a click of the mouse, followed by completing the user's master data. An increasing number of large companies are practicing this method.
Powerplay	For most large companies, it is also possible to achieve an electronic invoice share of at least 80% after 3 years. The "Pressing" method is enriched with penalties for counterparts which insist on paper invoices. Electronic invoice exchange is declared as the default channel, but penalties are applied for paper invoices: • Suppliers charge typically EUR 1 – 3.50 to consumers and EUR 5 – 25 to companies per paper invoice • Buyers reduce the paid invoice amount typically by EUR 15 – 25 per paper invoice if the suppliers are not willing or not able to send the invoices electronically
Closed electronic loop for orders and invoices	In many large companies, at least 40% of the invoices are based on Purchase Orders. This rate is steadily increasing. Enterprises have the chance to receive all PO-based invoices electronically within just a few months. Suppliers are keen to get purchase orders. If they only get the chance to receive them electronically in the future, they will accept the new channel rapidly. In addition, they also have the chance to return invoices electronically. This model results in a quick win-win situation for suppliers and buyers.

Considering these known facts, it is surprising that many organizations do not switch to more promising on-boarding methods.

4.2.4.2 Enhance the degree of process optimization

Today a major bulk of electronic invoices is just digital images of paper. This is not really a surprise, as people are familiar with PDFs and the barriers to start with are quite low. However, the benefits are mainly on the supplier side and buyers are keen to move towards the next steps.

Improvements, which can be noticed on the market

- PDF Images → Intelligent PDFs including images + structured invoice data (+ interactive components, digital signatures, logfiles, workflow functionality); PDF invoice becomes interpretable by both humans and computer systems
- PDF Images → structured XML invoices
- Scanning of images only → Scanning + OCR + Workflow

Any development as mentioned above helps to increase the degree of automation on the recipient's side as well. The weak economy might accelerate the next evolutionary step towards fully automated processes and to tap the full potential in the mid-term.

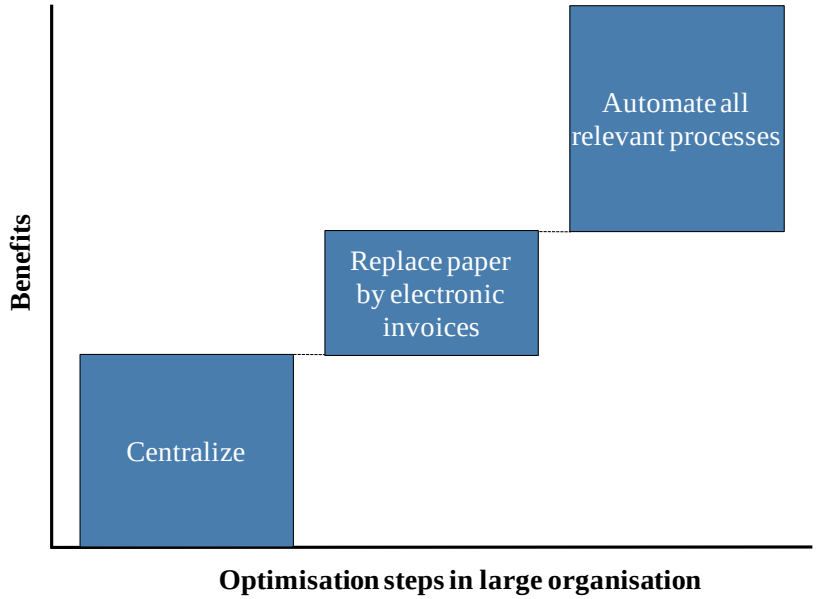
4.2.5 Scenario for internal implementation

Typically, 30% of larger companies still manage the invoices decentralised. Almost all of them use several ERP and accounting systems. This environment does not allow the financial manager the required transparency about the number, the total amount and the status of invoices.

E-invoicing often results in a central outbound and inbound gateway, aggregating all invoices. This significantly increases transparency for finance managers and is a pre-requisite to optimise the working capital.

In a fragmented and large environment, the highest benefits can be achieved by following these steps.

Figure 27: Optimisation steps and benefits



As this objective can be (too) time consuming (e.g. 2 years) a good alternative is migration within a decentralised environment. If the constraints of future centralisation are already known, they can be considered in the planning and implementation of systems and processes.

Improve to electronic and automated processes is generally a good step. However, in most organisations, it may be advisable to critically scrutinize and streamline first all the processes. Often, 30% of historic burdens can be removed without loosing anything.

4.2.6 Potential involvement of third party solution providers

Complete in-house developments are no longer a realistic option

- No chance for a good business case due to high project/development costs and very high follow-up costs
- Too time consuming
- No reason to re-invent solutions which are already offered by hundreds of solution providers and which are up-and-running already in other companies

Therefore, the real alternatives are purchasing third-party applications or using external cloud services.

Figure 28: Third-party services and applications

Services	Applications/Solutions
• SaaS (Software as a Service) • PaaS (Platform as a Service)	• e-billing/e-invoicing applications for automated or semi-automated issuing and

Services	Applications/Solutions
• E-invoicing network service (single-point-of-contact; any-to-any-to-any connection) • Any-to-any data formatting • Rule based data validation • VAT tax compliance service • Invoice management service (including digitalisation and data capture of remaining paper invoices) • E-Procurement, E-Marketplace • Archiving Service • Supply chain finance • Advanced analytics • E-reporting • Others	receiving electronic invoices, including handling of various output/input formats • Signature software or devices, Public Key Infrastructure (PKI); Signature verification tools and portals • Invoice cockpit (monitor all invoices circulating within an organisation) • Invoice management • Workflow • E-Procurement • Interface software o data conversion and mapping tools o printer driver with e-invoice transfer features • Archive

The scenario chosen from the above will depend on
- Make or Buy policy of each organisation
- Own IT and processing environment
- Invoice volume
- Business Case
- Internal requirements
- Requirements and capabilities of counterparts

Larger organisations quite often analyse 2-3 scenarios, compare them and decide on one of them. This step is then followed by a Request for Proposal (RFP), sent to 2-4 providers.

4.2.7 Compliant rollout model for your counterparts

Technique is just a small part of an e-invoicing project. Much more important for the success and a high electronic share is the rollout strategy (on boarding of trading partner).

Figure 29: Different rollout models in use

Opt-In	A issuer or recipient upgrades his environment for electronic invoice processing. He informs his counterparts about this new opportunity and invites them to send and/or receive invoices electronically. Each participant has to be persuaded to change to electronic invoicing. This can be done with strong arguments, incentives and/or slight pressure. The traditional and friendly method of taking companies on board was used in the past, but is more often replaced by the Opt-Out model where possible.
Opt-Out	A issuer or recipient upgrades his environment for electronic invoice processing. He informs his counterparts about this new opportunity and explains that after a certain deadline, invoices will only be exchanged electronically. If anybody wants to “opt-out”, they have to give notice. In many cases, it means also a (penalty) fee for keeping to paper based invoices. The Opt-Out model results in very quick results and a high electronic invoice volume. It can be practised by any larger organisation, but is mainly at the forefront for organisations in a steady interaction with a stable base of counterparts (e.g.

	Leasing companies, Transport & Logistics, Telecom, Utility, Credit & Customer Cards, Office Material, Suppliers of MRO articles and customer packaged goods, Online Services and any communities using Extranets or standard client software). Today's issuers who use this model quite often use signed PDF invoices with or without additional XML data. This guarantees immediate readability by the recipient, although the benefits for them can be quite limited in the case of PDFs.

Figure 30: Success rate for an organisation and the electronic proportion one year after launch

Model	Electronic proportion of all invoices
Issuer driven "Opt-In"	1-5% with free market range 5-50% within existing supplier-buyer networks
Issuer driven "Opt-Out"	85-90%
Recipient driven "Opt-In"	1-5% for organisations without much purchasing power 50-70% for organisations in strong purchasing position
Recipient driven "Opt-Out"	Up to 90% for organisations in strong purchasing position and providing electronic orders

The majority of businesses in Europe do not have an ideal environment for using an Opt-Out approach. However, the model should be tailored to its practicability for each environment. Certainly, it will be practised eventually by some of your counterparts, with a direct impact on your situation.

4.2.8 Potential barriers and how to overcome them

The barriers differ greatly for enterprises in various countries and depending on the company size.

Figure 31: Main barriers in many European countries

Barriers (European mass market)	Possible actions to overcome them
Legal requirements are unknown or confusing	The multi-stakeholder fora and/or federal administrations are privileged to actively provide appropriate information to the mass market. Some of them organize information events & road-shows or engage evangelists. Many others (e.g. Austria, Belgium, Germany, Switzerland, United Kingdom) operate an information portal with the most important information.
Missing market transparency about the solutions offered and the collaboration among various service providers	The multi-stakeholder fora and/or federal administrations are privileged to actively provide appropriate information to the mass market. Some of them already provide a broad overview on information portals. The best-in-class offers segment specific information (small company selects "I am a small biller" or "I am a small invoice recipient" etc. and guide the visitor through an interactive dialogue to provide exactly the appropriate information (lean).

Barriers (European mass market)	Possible actions to overcome them
Change/adoption of internal organisation processes (40% of larger organisations)	It is human nature that old habits die hard. This is especially valid if very numerous departments are affected by a project and have to change. Management attention and decisions are required.
Divergent requirements of trading partners regarding formats, methods and processes	As this is especially painful in case of bi-lateral (direct) exchange of structured electronic invoices, using standards can help. E-invoicing network operators are also capable of significantly reducing the complexity for end-users.
Not recognizing the business case	Further market communication is required, especially by showing very concretely the individual saving for a certain outbound or inbound invoicing volume.
Trading partner does not support the electronic invoice	Viewed statistically, there is a relatively high chance that your trading partner already supports e-invoicing. It could more likely be a lack of information. Some federal administrations or multi-stakeholder fora already maintain public user directories. By far the best running example is from Finland, http://www.tieke.fi Besides increasing transparency, often the trading partners just need inspiration to do it now and some guidance on how to do it.
Task sharing for accounting and invoice processing with external parties (trustee, tax consultant, commercial auditor, etc.); is in some countries practised by up to 50% of (smaller) enterprises.	Third party service providers have fears of or limited interest in substituting labour-intensive (paper based) work with efficient, electronic and automated processes. It could be a major task for multi-stakeholder to clarify and show the risk of resistance to the opportunities of new electronic methods.

Figure 32: Main barriers for mid-sized and larger US companies

Barriers (mid-sized and larger US companies)	Possible actions overcome them
Lack of budget	In-house developments cause high initial and follow-up costs. Field-tested applications and services from third parties are typically significantly cheaper. If services on demand or SaaS are preferred, the initial investments are moderate.
Belief that there will not be an ROI	Publicly available calculation tools / ROI calculators will probably show the reader within 5 minutes that there definitely will be a good ROI.
Lack of understanding of current available solutions	Some market analysts make the market more transparent with their publications and events. Solution providers are encouraged to make great market communications.
Lack of resources to manage automation	Shift e-invoicing to the enterprise's number 1 priority.

Barriers (mid-sized and larger US companies)	Possible actions overcome them
Supplier resistance	Do not attempt to press all suppliers into the same scheme and require just one certain data format following your business process. The capabilities and requirements of suppliers differ greatly. If invoice recipients (or the e-invoicing network operators involved) support various invoice formats, any-to-any data formatting and benefits (e.g. trade finance, early payments), acceptance by suppliers can significantly increase.
Current processes work	Complacency is a risk. It is likely that competitors are already implementing e-invoicing, reducing the invoice processing costs and achieving a competitive advantage.

4.2.9 Roadmap

Small organizations can technically become up-and running within just a few days. More time consuming will be the onboarding of the counterparties.

In large organizations, the project and implementation time can strongly vary, depending on existing environment and degree of integration.

Figure 33: Indication for project and implementation time

Scenario	Centralised, homogeneous environment	Decentralised, heterogeneous environment
Key-in/upload invoices via third party Web portal or printer driver Receive/download invoices via third party Web portal Archive operated by third party	0.1 – 1 days	1 month
Invoice export/import via AR/AP application Archive operated by third party	0.5 – 2 weeks	3 months
Scenario above including analysis, re-design, workflow and archive implementation	6 months	1 – 1.5 years
Scenario above, including integration of invoices with related messages along the supply chain (order, delivery notes, payment, remittance etc.)	up to 1 year	up to 2 years

4.2.10 Project Checklist

Corporate digital strategy

Analysis

- Internal
  - Involved and related processes, systems and divisions/branches/subsidiaries
  - Invoice streams
  - Old burdens from the paper world to be removed, disrupt, reengineer

  - Obstacles and how to solve them
  - Structure, capability and legal constraints (especially in multi-national companies)
- Of your counterparts
  - Volume
  - Technical capability
  - Willingness to adopt
  - Legal framework
- Strategic focus and priorities

Concept
- Solution scenarios
- Decision Make or Buy
- Step-by-Step approach (division by division) or “big-bang” (company-wide project)
- Implementation scenario
- Required investments and operation costs
- Rollout strategy

Request for proposal (RFP)
- Top 20 requirements
- Other “nice to have” requirements

If solution or service is to be purchased
- Provider evaluation
- Benchmark
- Contract
- Test

Implementation
- Internal adoption
- Test
- External adoption with suppliers and customers
- In countries where legally required (Germany, Switzerland, …): Document everything in a “procedure documentation”

Rollout
- Concept with scenarios for each sector of counterparts
- Dialogue with key suppliers and customers
- Mass-rollout

During the whole project: Communicate at least twice as much as you believe is necessary – you can never over-communicate!

4.3 Success factors and benefits

4.3.1 Success factors

Although we have a high number of innovative people in our world, the majority of human beings change their behaviour only under slight pressure. That is why a simple invitation to your trading partners to support e-invoicing may not automatically result in a quick success.
The weak economical situation results in high cost pressures and will probably become an accelerator for changes in the invoice processing. Readers are not recommended to wait for pressure

from their customers or suppliers. Instead, it is wise to start an e-invoicing project proactively. Only then is it possible to clarify everything without too much time pressure and to move seamlessly from paper to electronic invoices.
Main reasons why e-invoicing projects have not always succeeded immediately in the past are

- Underestimating the significance of the project for the many related processes and departments involved
- Poor project management
- Too technical focus (the more important challenges are the process automation and taking on board a high number of suppliers or customers within a short time)

Success factors in e-invoicing projects

- Awareness by senior executives about the potential of E-invoicing in a broader sense (the value is much more than just eliminating printing and stamp costs or entering invoice data into the ERP system)
- Management Support, as many divisions within an organisation are involved
- One very active project owner
- Defining a three year objective/strategy, but implementing it step-by-step including a quick-win result for step 1 (best is just one invoice stream in one division of a big company)
- Internal and external communication to key persons affected
- Being a rollout champion with an excellent strategy for taking on board a high number of suppliers/customers (opt-out strategy if possible, combined with active marketing)
- Being realistic regarding mid- and long-term technical capabilities in your organisation including workflow and archiving → right decision for make/buy and direct or network model
- Don't re-invent and develop solutions which are already available for a fixed price and which have been well tested in other companies
- Being realistic regarding technical capability of your counterparts to send, receive and archive electronic invoices (this is quite often dramatically lower than you expect); simple and economical interfaces and possibly a third party archiving service are essential

4.3.2 Benefits and Business Case

For about two decades, the private industry was the only driver for the market development of e-invoicing. Users decided to migrate to electronic processes to take advantage of several benefits such as

- Process innovation and automation
- Improve operational efficiency; reduce the high proportion of discrepancies and manual exception handlings
- Improve accuracy of master data and the invoice content respectively the compliance with orders and contracts
- Increase tax compliance
- Optimise cash management
- Increase business agility
- Reduce invoice fraud
- Increase transparency
- Environmental improvement
- Satisfy the demand of key trading partners for digital interaction
- Reduce costs

The implementation of e-invoicing is partly an IT project. Due to this fact, especially larger businesses had to calculate a business case in the past.

These business cases roughly confirmed this generic rule: Electronic and automated invoice processes can result in savings of 60-80% compared to traditional paper-based processing. Projects typically result in a payback period of 0.5-1.5 years.

According to many surveys, about 80 percent of the larger companies in advanced economies are meanwhile users of e-invoicing, although some may exchange just a small proportion in electronic format. Nevertheless might they have achieved a good business case. By experience are there just a few reasons that the result was not fully satisfying. A typical example is if the internal operation of the old paper-based invoice processing is remained in parallel to e-invoicing instead of migrating internally completely to digital processes. A further example is if businesses try to develop everything in-house instead of using field-tested solutions of third parties. Another reason is quite often that organisations follow just a reactive approach instead of proactively define a strategy and implement in a planned and coordinated manner. They suffer of the heterogeneous IT, process and compliance environment that appears over the years.

We estimate that today around 30%, but in 2020 already 60% of organisations will be forced either by legislation or important trading partners to exchange invoices just in electronic format. Hence, a business case can no longer be the trigger for a GO or NOGO decision. Rather could it be replaced in the future by a calculation comparing the values generated by certain solution providers.

However, if anybody still is interested in more details of a business case, some more information can be found in the document http://www.billentis.com/e-invoicing-businesscase.pdf

4.4 The e-invoicing opportunity

E-invoicing and business process automation might be THE answer for today's challenges in the market.

The time is right for taking the next step now!

5. OpenText

Headquarters:

OpenText
275 Frank Tompa Drive
Waterloo, ON N2L 0A1
Canada

Countries with highest e-invoicing revenues	France, Germany, UK, USA
VAT compliant e-invoice processing guaranteed for	46 countries – including: AUS, AUT, BEL, BRA, BGR, CAN, HRV, CYP, CZE, DNK, EST, FIN, FRA, DEU, GRC, HKG, HUN, ISL, IRL, ISR, ITA, LVA, LIE, LTU, LUX, MEX, MAR, NLD, NZL, NOR, POL, PRT, ROU, ZAF, SGP, SVK, SVN, ESP, SWE, CHE, TUR, GBR, USA
Number of employees dedicated to e-invoicing and directly related offering	>1000
Registered users on own e-invoicing platform	Connected Businesses: >600,000 Customers: >40,000
Processed volume on own e-invoicing platform	Almost 1 billion e-invoices per year
Core offering	Active Invoices with Compliance for E-Invoicing for AP and AR, Active Orders for P2P automation, digital enablement for SME trading partners, OpenText Trading Grid®, B2B Managed Services.
Covered processes/messages along the supply chain	End-to-end physical/financial supply chain automation – from order through to invoice/payment. Support for multiple standards; can support custom messages.
Value-added services	Trading partner on-boarding services; Active Community for community management.
Main target market segments	Large Enterprises – simple to complex E-Invoicing scenarios. Cost-effective solutions for enabling connectivity with non-digital trading partners.
Supported languages (with application/service and the online-help/customer support)	English, French, German, Italian, Spanish, Japanese, Korean, Portuguese, Chinese.
Competitive differentiator	Truly global network and presence, with the world's largest business network and range of E-Invoicing solutions available to suit the needs of enterprises in a variety of industries.

OpenText

OpenText operates the world's largest business network with over 600,000 connected businesses and over 16B transactions per year. OpenText (formerly GXS) has provided electronic invoicing solutions globally for over 40 years. Today, we provide E-Invoicing services for thousands of enterprises with SaaS and outsourced options to suit each customer's specific E-Invoicing requirements.

OUTBOUND E-INVOICING
OpenText enables companies to exchange electronic invoices via EDI and other preferred methods. Suppliers create electronic invoices directly from Oracle, SAP or other G/L accounting applications and we extract information from these enterprise systems, converting data into the buyer's preferred electronic invoicing format.

We can also create and send compliant PDF invoices to smaller businesses who do not have automated ERP/accounting systems.

Business to Government (B2G E-Invoicing)
In an increasing number of jurisdictions it is now mandatory when trading with government entities like schools, hospitals and local/regional government offices to switch to electronic invoicing. OpenText supports B2G e-Invoicing in a range of countries.

INBOUND E-INVOICING
OpenText delivers your supplier invoices and other documents according to your accounts payable system's required format. As a result, invoices flow directly from suppliers into your enterprise systems without the need for manual intervention – enabling straight-through processing.

For inbound e-invoicing we also provide:
- Three-way matching of PO, shipment receipt and invoice document
- Exception alerts
- Configurable business rules for monitoring data quality, process steps, and time-based activities
- Regulation compliance in 46 countries

E-Invoicing with non-digital trading partners. We provide a range of cost-effective connectivity solutions for enterprises to integrate with their non-digital trading partners.
- Web-based portal
- Excel®-based connectivity

E-INVOICING COMPLIANCE
Our solutions are tax compliant globally, meeting legislation within the EU, North America, Latin America and Asia Pacific for both outbound and inbound E-Invoicing. Our E-Invoicing solution is inclusive of EDI, digital signature and government integrated processes as permitted/mandated.

Many countries, particularly in Europe and Latin America, enacted tax legislation to regulate electronic invoicing. We offer digital signature and EDI solutions that shield customers from compliance complexity by providing:
- Content validation
- Digital signature
- Electronic archive
- Delivery to tax authorities
- Human readable invoice creation

Website: Visit us at www.gxs.com and www.opentext.com for more information. Also visit www.einvoicingbasics.com for advice on eInvoicing adoption and implementation.
Contact: www.opentext.com/contact

SUCCESS STORY | esprinet

OPENTEXT™

Esprinet Streamlines Electronic Document Exchange with OpenText

OpenText™ B2B Managed Services removes burden of set-up and maintenance, provides greater automation, and improves efficiency

Esprinet is a wholesale technology distributor in Italy and Spain with consolidated sales of €2.3 billion in 2014. The company was established in the 1970s and today supplies more than 600 brands to more than 40,000 resellers. The business has grown to be No. 1 in Italy, No. 3 in Spain, and fifth overall in Europe. Esprinet's unique internet-based business model is especially focused on delivering technology to resellers that address the small-to-mid-size business sector, retailers, and corporates. Top brand names, such as Apple®, IBM®, HP®, Toshiba, and Lenovo™, among many others, form the portfolio offered by Esprinet. The range of technology embraces personal computers, tablets, supplies, consumer electronics, servers, networking, storage, peripherals, and software with more than 45,000 Stock Keeping Units (SKUs).

For more than a decade, many of Esprinet's large suppliers have mandated Electronic Data Interchange (EDI) as the only means to exchange documentation relating to orders. These include the orders themselves, acknowledgements, shipping notices, receipts, invoices, and credit notes. Having researched potential solution suppliers, Esprinet selected OpenText and established its first connections, mapping the various data points internally to enable the exchange of data.

Quicker Set-Up for New Data Mappings and Updates

With a growing number of suppliers moving to EDI, Esprinet found it was expending greater amounts of precious internal resource on establishing new connections. Each connection would have its own nuances, unique data points, and these all had to be taken into account. Added to this, many existing suppliers would periodically require changes to be implemented.

Massimo Patrussi, System Development Manager at Esprinet SpA expands, "We turned once again to OpenText to explore more efficient and effective ways of administering our trading partner data mappings. The answer was OpenText B2B Managed Services.

INDUSTRY

Technology/Distribution

CUSTOMER

Esprinet SpA

CHALLENGES

- *Speed of establishing and maintaining data mapping for electronic document exchange with suppliers and customers*
- *Increasing automation and streamlining data interchange with other internal systems*
- *Poor control and checks of directly shipped consignments from supplier to customer*

SOLUTIONS

- *OpenText™ B2B Managed Services*

BENEFITS

- *Data mappings are seamlessly maintained, providing faster updates and reducing workload*
- *Automation improving business processes with faster throughput and processing*
- *Secure, reliable data interchange*

We now simply inform OpenText of our requirements and they take care of setting up the necessary configurations, calling upon their extensive experience and knowledge of numerous data standards."

Being able to release staff from the workload involved in establishing and maintaining these connections has meant that focus can be applied elsewhere.

Greater Efficiency through Automation

When a supplier submits an invoice to Esprinet, procedures are now in place to automatically check that the invoice is correct.

"With the data received via B2B Managed Services, the system now quickly and automatically checks the invoice against a PO, confirming goods have been received and match delivery notes. We're then able to automatically pass the data to our core financial systems. This all saves time, reduces the potential of human error during data entry, and provides us with a complete audit trail," adds Patrussi.

Not only does Esprinet receive documentation from trading partners via B2B Managed Services, but the company also sends documents too. Orders can be sent quickly and efficiently upon receipt from customers, speeding up delivery times in a time-sensitive market.

Using a Single, Esprinet Document Format Simplifies Internal Processes

With OpenText taking care of document mappings on behalf of Esprinet, not only has this released valuable internal resource, it also means that they can work to a single, internal format.

"We used to have to manage multiple document/data mappings ourselves. Now we have our own standard and rely on OpenText to map that to the standards used by external parties, saving time, avoiding errors, and reducing the maintenance overhead too," says Patrussi.

When a new supplier or customer comes on board, everyone at Esprinet knows they will quickly be up and running, thanks to the responsive service provided by OpenText.

"Like others in the organization, our purchasing department is very happy with the service provided by the OpenText solution. They no longer have to manually process purchase orders, perhaps placing them onto a supplier portal, producing PDF documents, and sending emails. They simply select the order in their system, click to send, and the order is transferred by B2B Managed Services to the supplier. Manual work is dramatically reduced, as are errors," says Patrussi.

The purchasing department also benefits from an immediate response and acknowledgement of the order being accepted from the supplier. They can then easily track progress as updates from the supplier are automatically fed back into their purchasing system via OpenText.

Esprinet Customers Benefit from Improved Stock Information

Using B2B Managed Services, suppliers also provide regular stock and delivery information to Esprinet. This data is then automatically used to update inventory and to provide detail of expected deliveries to customers.

"Where a product is not in stock or is awaiting shipping, our customers are able to view expected delivery dates. This data is automatically and seamlessly received, processed, and updated onto our website, thanks to the data received with OpenText," says Patrussi.

The accounting department benefits too, with greatly reduced manual data entry meaning reporting is more up to date, there are fewer errors, and automatic checks help highlight exceptions where manual intervention is required. The whole solution helps Esprinet meet Italian fiscal rules too, with full audit trails and reporting.

Esprinet sends and receives about half a million documents every year via B2B Managed Services using the OpenText™ Trading Grid™ Messaging Service. Handling such volumes manually would be a monumental task, even if trading partners would allow it, which most would not.

"We're constantly looking at how we can further improve or automate our processes," says Patrussi. "Should that involve a change to our trading partner data mappings, or should a new partner come on board, we know that we can rely on OpenText to take care of things for us quickly and efficiently."

OPENTEXT™

Semiconductor Supplier Sharpens Competitive Edge

ON Semiconductor reduces supply chain costs, meets customer need for seamless exchange with OpenText™ B2B Managed Services

With its global logistics network and strong portfolio of power semiconductor devices, ON Semiconductor is a preferred supplier of power solutions. The company's development and manufacturing centers span the globe and employ more than 22,000 people worldwide.

Competitive Market, Disparate Protocols

Many customers think of power semiconductor devices as commodities. Although ON Semiconductor strongly disagrees with that view, it is frequently the perception under which the company must operate. Consequently, to win a larger share of the market while avoiding a pricing race to the bottom, ON Semiconductor must find other ways to differentiate itself. ON Semiconductor believes that it can achieve a competitive advantage by improving the ease, quality, speed, and processing costs of the transactions—purchase orders, shipping notices, acknowledgements, invoices, etc.—that it exchanges with its customers. Enhanced electronic data interchange was an obvious path to achieving these objectives.

With most of ON Semiconductor customers already using electronic communications of some sort to interact with their suppliers, there was no consistency or standardization. Different customers use different technologies and protocols, such as electronic data interchange (EDI) and application-to-application interfaces.

In fact, ON Semiconductor did a survey and found that each customer employs an average of 2.9 different connectivity options. The survey showed EDI as the most used business-to-business connectivity standard today, with 73 percent of respondents employing it. Moreover, the use of the RosettaNet™ protocol is particularly strong in Europe, which requires further support to gain market share in those regions.

In addition to supporting that one protocol, the company wanted to be able to offer customers a portfolio of EDI options that would support not only the technologies in use today, but also those that would come on stream in the future.

Developing numerous protocol capabilities in-house would require a very large upfront investment in hardware, software, and skills. Because of this, ON Semiconductor opted to use OpenText B2B Managed Services instead of building out the protocol capabilities in-house.

INDUSTRY

Semiconductors

CUSTOMER

ON Semiconductor

CHALLENGE

- *Differentiate service in competitive market*
- *Supply environment with variety of transaction interchange standards*

SOLUTION

OpenText™ B2B Managed Services

BENEFITS

- *Reduces supply chain transaction costs*
- *Boosts capacity to successfully address fluctuating transaction volumes*
- *Increases the company's share of customers' purchases*
- *Allows you to cost-effectively and quickly adopt new industry-standard technologies*

"Many customers are looking to take out complexity and cost, and speed up their supply chain. OpenText helps us to be responsive to their desires and requirements to increase the amount of electronic data interchange, thus enabling frictionless business transactions. That's a big part of our plan to earn a greater share of our customers' semiconductor wallet."

DAVID WAGNER, CIO, ON SEMICONDUCTOR

Seamless Data Exchange

With B2B Managed Services, an experienced team of specialists using best-in-class methodologies has access to a state-of-the-art network and hosting infrastructure. The result is seamless data exchange and transformation between business partners of all sizes and technological sophistication.

OpenText acts as the intermediary between ON Semiconductor and its trading partners in both EDI and RosettaNet environments, running over a variety of communications infrastructures, including transmitting data over the EDI network. In addition, the platform automatically matches related transactions and monitors transaction traffic, automatically alerting ON Semiconductor in the event of any errors or exception conditions and helping customers to join the trading network.

While owning, managing and maintaining all of the hardware and software necessary to run the VAN, OpenText also monitors the infrastructure and protects it with a comprehensive high availability solution to provide near 100 percent uptime.

Once ON Semiconductor and one of its customers come to an agreement on what data they are going to exchange and how they are going to exchange it, the company uses B2B Managed Services to ensure protocols and standards set up in the EDI or RosettaNet environments are harmonious, allowing the companies to successfully interact.

After the setup is complete, the parties on both sides of the supply chain—ON Semiconductor and its customers—interact through a single hub. Each company can use a protocol and communication technology of their choosing as the VAN takes care of all of the transmission and translation necessary to exchange data and transactions between the parties. Consequently, ON Semiconductor manages only one interface, rather than having to connect individually to 500 different customers.

Because OpenText maintains sufficient excess capacity to serve its large customer base, ON Semiconductor can immediately scale up or down its traffic through the VAN as required. Furthermore, the company pays for usage rather than incurring a large up-front cost and ongoing fixed expenses to build and maintain the infrastructure and staff that would be required to facilitate peak transaction flows across a growing customer base.

OpenText provides around-the-clock monitoring and service for the VAN, ensuring that ON Semiconductor and its customers can get support whenever they need it. This support capability would have been costly to maintain in-house as ON Semiconductor's diverse customers operate in time zones spanning the globe and some of them run 24/7 operations.

Frictionless Transactions, Competitive Edge

According to David Wagner, CIO at ON Semiconductor, customers are their key area of focus. "Many customers are looking to take out complexity and cost, and speed up their supply chain. OpenText helps us to be responsive to their desires and requirements to increase the amount of electronic data interchange, thus enabling frictionless business transactions. That's a big part of our plan to earn a greater share of our customers' semiconductor wallet," he explains.

"What we're getting as a result of our relationship with OpenText is the ability to scale our costs more appropriately as we go rather than having to make a large investment to build our own infrastructure to handle the new standards," adds Wagner. "We've come up with a plan that allows us to look at RosettaNet and address these costs in a much more incremental and palatable way."

Ready-made, on-demand expertise is another major benefit that ON Semiconductor receives from B2B Managed Services. According to Todd Johnson, IT applications director at ON Semiconductor, "OpenText helps us stay current with our trading partner's technologies, which is important to us. It helps us migrate quickly into the leading edge technologies such as RosettaNet. Having OpenText as a managed services partner makes it very easy to deal with those scenarios.

"The team from OpenText has worked with us in a creative and solution-oriented fashion to help us deliver better solutions to our key customers. This allows us to differentiate ourselves from our competitors and position ourselves to earn a bigger component of our customers' semiconductor business says Wagner. We look forward to continuing to drive this capability. The thing that is very positive for us is that we are working with a partner who is helping us to meet our goals, while allowing us to scale our costs appropriately".

SUCCESS STORY | WHSmith

OPENTEXT™

WHSmith Continues e-Commerce Leadership

Leading British retailer relies on long-term partner, OpenText to streamline supply chain

WHSmith is one of the largest retailers in the United Kingdom (UK), with more than 600 High Street stores and 600 stores at airports, train stations, and service areas. It focuses on the sale of stationery, books, entertainment, and news.

Cutting Manual Delays

According to Alastair Reid, support manager for the Trading and Marketing teams at WHSmith, introducing e-commerce helps to increase the speed at which WHSmith operates by streamlining and enhancing services in a number of operational areas.

Using electronic data interchange (EDI) to place orders, receive confirmations, and transmit shipping notes and invoices allows stores to have stock replenished on shelves within two to three days of selling an item like a book. In other areas of the business, WHSmith cut lead times for new stock from several weeks to less than a week. This enables the organization to move to a direct-from-supplier supply chain model. Instead of shipping orders to stores from stocks held in warehouses, they now have consolidation centres that take incoming orders from suppliers, split them by store, and consolidate goods from many suppliers into a single delivery for each store.

Consolidating E-Commerce Activities

Being a long-term user of a number of EDI translation and transmission solutions from OpenText to deliver its e-business strategy, WHSmith decided to consolidate its e-commerce activities using OpenText™ B2B Managed Services. The organization had data coming in and out of its systems through a variety of routes, and some were less secure or robust than others. It was also supporting a number of value-added networks and data exchange mechanisms. WHSmith wanted to keep that flexibility, but create a more robust and secure service that was less complex and risky to operate. A managed services solution promised unification and simplification into a black box whose detailed operation is managed by an expert partner.

INDUSTRY

Retail

CUSTOMER

WHSmith

CHALLENGES

- *Manual processes caused delays for replenishing stock*
- *Lead times for new stock could reach several weeks*

SOLUTION

OpenText™ B2B Managed Services

BENEFITS

- *Faster stock supply, from weeks to days*
- *Supply chain visibility*
- *Reallocation of staff to value-added efforts*
- *Integral component to business success*

"The demands of the business dictated we needed an enterprise-level solution. OpenText is the leading provider, and offers us the best solution in several ways."

ALASTAIR REID, SUPPORT MANAGER FOR TRADING AND MARKETING, WHSMITH

According to Reid, OpenText was the natural choice. "The demands of the business dictated we needed an enterprise-level solution. OpenText is the leading provider, and offers us the best solution in several ways." One key factor was the company's global presence, which allows the managed service to become a platform for growth at WHSmith rather than an inhibitor. "We now have a mechanism for taking on partners, regardless of their physical location. That gives us a much higher level of confidence in expanding our trading networks outside the UK," he adds.

B2B Managed Services also allows WHSmith to trade electronically with partners of all sizes and levels of technical sophistication. They're not cutting anyone out at either end of the spectrum, or being forced to work at the lowest common denominator. WHSmith can support those who are just discovering EDI, but also accommodate those at the cutting edge.

Another benefit of B2B Managed Services is that it insulates WHSmith from the impact of new technology and e-commerce standards developments, such as a number of other retailers moving to AS2. "OpenText can in the future facilitate us offering an AS2 solution if some of our partners feel that's what they need to have at their end to trade with other retailers, without forcing us or the rest of our supply base down that route as well," Reid explains.

He adds that, unlike many of its competitors, the OpenText™ Trading Grid™ provides a service that supports a wide range of data exchange mechanisms beyond basic EDI, again meeting all of WHSmith's needs through a single solution. "While EDI is the core of our business, and accounts for the bulk of our data transfer, using mainly the Tradacoms standard but also some Edifact messages, we do have some systems that use other protocols including FTP or flat files," he explains. "OpenText can support all of that, allowing us to work with a single provider and simplify our own operations."

Reid praises the reliability and responsiveness of the service. "We can go days or even weeks without the service needing any attention from us," he says. "When issues do arise, the OpenText service desk is very good, providing a quick turnaround to investigate and solve problems."

In addition, the ease with which the managed service can be integrated with WHSmith's internal systems has been a key enabler in a long-term project to move all of the retailer's operations away from mainframe-based applications. OpenText supported WHSmith through the process of unravelling services from the mainframe and making them available in a simplified service-oriented environment.

B2B Managed Services also allows WHSmith to work with suppliers in a variety of ways, easily supporting trading arrangements that range from traditional daily ordering by store managers, to providing sales and stock data to suppliers to support a vendor-managed inventory approach. In addition, B2B Managed Services provides real-time transmission of data rather than overnight batch delivery, a vital process when some suppliers only send delivery notes at the last minute as the stock is arriving at the warehouse. The managed service ensures delivery note details are available for warehouse staff to access through the warehouse systems within minutes of them being dispatched.

B2B Managed Services now supports the exchange of orders, confirmations, dispatch notes, invoices, and credit and debit notes with suppliers of stock for WHSmith stores, along with information about sales, stock, recalls and returns. It also handles transactions to procure items used internally, and supports sharing of business and market intelligence both internally and with partners such as Chart-Track.

Supplying Clarity and Confidence

Since introducing B2B Managed Services, WHSmith has been able to reallocate staff away from processing paper or manual rekeying of data, deploying them on activities that add more value to the business and make better use of their expertise, such as investigating anomalies in invoices. This has been coupled with greater visibility across the supply chain. Exception reporting is now faster and simpler, with business users in WHSmith trading teams now able to answer queries from suppliers more easily and quickly. "B2B Managed Services visibility portal allows them to monitor all activity in and out of the business themselves," Reid explains. "They can look up the status of an order or invoice directly, without needing to request reports from our central e-commerce service delivery team."

The company is determined to get every one of its business partners communicating electronically. "We have a steady programme of migration on a one-to-one basis with suppliers," Reid explains. "OpenText is a key part of that, helping us ensure the message exchange process is fully tested and working robustly before we go live. Lots of partners see introducing EDI as a big leap of faith but, thanks to the support we get from OpenText, we see it as business as usual. It's a tried-and-tested process for us, and we approach it with confidence that it's practical, risk free and routine. Some of the larger suppliers we work with are dumbfounded to find us in such a position of clarity and confidence, but having OpenText as our managed service provider gives us that."

WHSmith also undertakes projects with existing partners to increase the range of messages it exchanges with them, or to enhance and extend their use. For example, it has extended its transactions with book suppliers, who have been long-term users of EDI-based ordering, to encompass delivery notes and invoices. This means they now have an end-to-end, two-way e-relationship with them. For this kind of project, OpenText has been a key partner in defining requirements, recommending correct message types and advising on how to use message segments to best effect, and helping WHSmith roll new message types out across the business rapidly.

As a result, WHSmith has been able to achieve even better value out of the EDI service through the variety of information it has been able to push through it. With help from OpenText, it has been able to ensure new message types typically pay for themselves within a year. "Overall, B2B Managed Services provides a very attractive cost proposition for us. In fact, it offers unparalleled levels of service and features compared with what the competitors charge for just transmission of messages," Reid explains.

He concludes, "B2B Managed Services is an integral part of achieving the benefits of any new project with our business partners, as well as central to our ongoing operations. We'd recommend OpenText to anyone for the end-to-end quality of service of its messaging solution, which is backed by 24x7 on-demand support that is excellent, regardless of the time of day or issue. The value delivered by B2B Managed Services is taken as a baseline by everyone: OpenText gives us a solution that is in line with where our business is going."

6. Appendix A: Tax compliant e-invoicing in an international environment

Appendix A written in cooperation with Christiaan van der Valk

6.1 Legal acceptance of electronic invoices

Almost all industrialised and emerging economies worldwide accept correctly processed & archived electronic invoices as originals for tax purposes. The growth of 'clearance' schemes is pushing forward broader adoption, making e-invoicing a compulsory and increasingly standardized business process in many countries. **Companies should not be asking themselves whether to adopt e-invoicing, but rather how to implement e-invoicing** while reaping all possible benefits and keeping at bay the risks associated with *ad hoc* reactive approaches. This appendix aims to provide basic recommendations to businesses seeking guidance on that challenge.

6.2 The fundamentals: be prepared for technology-focused requirements

As outlined in chapter 2.2.7, the global impetus towards different forms of 'clearance' means that tax compliance of e-invoicing processes is increasingly a matter of adopting various mandatory technologies alongside technology and process choices for business optimization purposes.

Until recently, especially in Europe and other 'post audit' countries, companies could address e-invoicing compliance as just another tax compliance matter where, logically, in-house tax experts maintained responsibility for interpreting the law and signing off on functional requirements based thereon. The shift in many countries towards models where business systems must share invoice data with government platforms requires companies to rethink this model; requirements for e-invoicing increasingly leave little or no room for legal interpretation. While the correct implementation and operation of technologies to meet e-invoicing requirements are ultimately still a matter of tax compliance, traditional tax experts with a legal and/or accounting background are rarely equipped to independently guide or judge the 'compliance' of a system with legal mandates that increasingly come in the form of technical specifications.

Does this mean that companies should delegate the implementation of e-invoicing compliance in such countries to the IT department? The author believes that this would be a grave mistake – we believe that going forward, requirements concerning the form, content and archiving of invoices and other important business and administrative documents will require a fundamentally interdisciplinary approach. Laws in 'clearance' countries will often address all these aspects as simply different dimensions of the same bundle of compulsory processes. Moreover, as we will see below, there are still many 'post audit' countries which are following their own path to optimized tax collection. Compliance with requirements in these varying and evolving regimes requires business, technical and tax/legal experts to cooperate in a well-documented change management process with ownership on the highest executive levels.

As we will see in the next section, we expect that companies will increasingly manage these challenges in collaboration with different types of third party technology vendors.

6.3 Categories of e-invoicing requirements

On a high level, the world is still divided between 'post audit' and 'clearance' models – but many countries are still on their individual journeys to their 'perfect' regulatory model to close VAT gaps and boost the economy. This section provides a snapshot of requirement categories viewed from a more pragmatic perspective.

Figure 34: Four types of tax compliance and methods of evidence

Type	Methods of evidence
Anti-Fraud compliance • Really existing trading parties • Supply behind an invoice	• Lookup with national business registers; know-your-trading partner and similar requirements. • Business Controls, Audit Trail, two/three way matching of invoice with contract, delivery notes, payment etc *These types of requirements are prevalent and often part of pre-existing generic (not invoicing-specific and not e-invoicing-specific) 'auditable administration' requirements in post audit countries; where specific measures in this category are expected in clearance countries, they are typically included in the compulsory clearance process specification.*
Form compliance	Ensure Authenticity, Integrity and Legibility of e-invoices. *Specific technical means towards meeting this type of requirements are built into the compulsory specifications in most clearance systems; they are typically a standalone requirement in post audit countries, and more often than not based on a free choice of means as to how these long-term evidence requirements are met.*
Content compliance Correct application of legal rules	Rule-based data validation either in-house or provided by third party service providers: Are all legally required data included in the invoice and in the appropriate format? Are taxes correctly calculated and associated mandatory information about tax categories correctly noted in the invoice? As invoice data becomes available to tax administrations in real-time or near-time, it becomes important to enhance the quality of individual invoice data and associated tax choices.
Clearance Compliance	For a description see chapter "Different forms of clearance models for e-invoicing and e-reporting"

6.4 Judging a platform or software vendor's compliance readiness

Increasingly, the reality of many companies is that they will rely on third party transaction and business process platform vendors to ensure continuous e-invoicing compliance on their behalf. Logically this means that also tax compliance functions must be addressed by such vendors.

In addition to vendors selected for their business advantages, in some countries with a 'clearance' model, private service providers accredited by the tax ad-ministration must be used, or their use may be among a limited number of implementation options. This is for example the case in Mexico, Russia, Turkey and Peru. In such cases, the service provider is primarily an agent acting on behalf of the tax administration (or at least performing processes that are regu-

lated and supervised by the tax administration) rather than a private vendor; however, it is common that such tax administration-accredited entities also provide non-regulated value-added services.

Outsourcing of tax-relevant functions never changes the fact that the parties to the underlying sales transaction are accountable to the tax authorities. Enterprises can seek to obtain warrantees for compliance with certain legal requirements by service providers, but this always remains a private agreement and has no impact on the taxable person's tax responsibility.

Also operationally, companies cannot simply push responsibility for e-invoicing tax compliance to a vendor and forget about it. Transactions will never be executed via or on a third party platform in a vacuum – there will always be many dependencies on a company's internal systems, processes and data. In addition, the tax compliance of invoicing and associated processes is simply too important to be left unsupervised: beyond indirect tax, historical evidence of business transactions can be critical to substantiate annual accounts for direct tax and many other purposes.

Compliance will therefore always require an effective partnership between a company and its vendor(s). Companies and vendors need to develop new approaches to managing these relationships. Over time, companies need to let go of the notion that they should have comprehensive substantive knowledge on all detailed compliance matters and rather find ways to effectively supervise the compliance capabilities and SLAs of their vendors.

What criteria can a business use to evaluate whether a prospective vendor is an appropriate partner to handle its tax compliance going forward? We believe that the following high-level categories must be addressed:

- ✓ **Compliance scope** – what category of legal requirements does the vendor ensure as part of its service portfolio? Does this correspond to the requirement categories you believe need to be addressed in your specific circumstances?
- ✓ **Contractual assurances** – are the included compliance categories sufficiently defined in your agreements with the vendor? 'Sufficient' should include an accurate description of legal requirements addressed; legal requirements that remain your responsibility; and, finally, any dependencies on your processes or data that the vendor defines as a condition for its contractual assurances.
- ✓ **Compliance monitoring** – does the vendor have processes (typically based on third party advisory retainers) in place to be notified of requirement changes within its compliance services portfolio?
- ✓ **Change management** – does the vendor have an adequate, well-documented process in place to make such adjustments to their services as required to meet new requirements defined through the monitoring system in a timely manner?
- ✓ **Compliance-oriented documentation** – does the vendor give you appropriate access to tax-oriented process and technical descriptions that you can integrate into your tax documentation model? (*Note* that maintain such documentation is an important aspect of tax compliance; it is considered good practice to performed regular joint reviews with your vendor(s) of how your internal and vendor documentation build an adequate tax compliance story).

6.5 E-invoicing in the European Union

Background

As noted above in this report, some countries in the EU (e.g. Portugal, Spain, Italy and Hungary) are transitioning to 'clearance'-type models. These models are at present geared towards reporting from accounting systems rather than strictly speaking constituting e-invoicing requirements, and they consequently don't replace e-invoicing requirements based on the EU VAT Directive; therefore they are not further described in this and the next section.

While it was stated above that the relative importance of the EU approach to electronic invoicing has somewhat diminished in recent years, it is worthwhile briefly looking back at the regulatory changes that entered into force early 2013. The primary purpose of the changes enshrined in VAT Directive No. 2010/45/EU, which creates the foundation for today's rules in EU Member States, was to give businesses more implementation choice as regards compliant electronic invoicing on the basis of a legal regime that in principle has the same requirements for paper and electronic invoices.

The key points of the Directive are

- The use of an electronic invoice shall be subject to acceptance by the recipient (remark of author: this can be a constraint for the usage of the Opt-Out rollout).
- It must comply with VAT Regulations
    - Electronic and paper invoices are to be treated equally – the administrative burden on paper invoicing should not increase.
    - The authenticity of the origin, the integrity of the content and the legibility of an invoice, whether on paper or in electronic form, shall be ensured from the point in time of issue until the end of the period for storage of the invoice.
- Proof of authenticity and integrity may be provided:
    - With any mechanism each taxable person deems suitable (setting a *freedom of evidence* rule for EU invoices, whether paper or electronic; note that evidence must still be provided within a reasonable time)
    - A reliable business controls-based audit trail between an invoice and a supply of goods or services. This method is available for paper and electronic invoices.
    - An advanced electronic signature on an electronic invoice based on a qualified certificate and created by a secure signature creation device.
    - Electronic data interchange (EDI) of electronic invoices.
- Member States do not have the option to impose other rules for e-invoices
- The rules regarding electronic invoices that apply are the rules of the Member State from which the supply is made (this relates to the complex subject of 'place of supply' rules but in practice is often the Member State of the supplier).
- Rules concerning the storage of invoices are in practice mostly determined by the Member State where the taxpayer is established.

Status

All EU Member States have now transposed Directive 2010/45, including the compliance options set out above. In a number of Member States, the tax administration has issued further guidance on each of the compliance options.

Not all Member States have faithfully transposed the Directive, and the trend today is rather towards more regulatory fragmentation:

- One group of countries have introduced additional options or requirements; this is today a strong trend where many Member States (e.g. Portugal, Hungary, Spain) introduce variations

of additional control mechanisms such as automated reporting, standard audit files, accounting software certification, data export requirements, invoice numbering requirements etc.
- Others have not implemented all elements of the Directive i.e. some have not explicitly transposed the freedom of evidence rule.
- Some countries do not mention all compliance methods, e.g. stating only one or a subset, or only the general requirement of integrity and authenticity.

6.6 Which B2B compliance method is appropriate for organisations in the EU?

The current European legislation aims to give enterprises more choice from among equivalent implementation options to meet the legal requirements of integrity and authenticity evidence. The base idea behind this new legislation is that business practice is too diverse to be caught in a limited number of compliance methods. However, more choice of means to comply also means that businesses will now have a greater *responsibility* to select an implementation option that ensures compliance. Unfortunately, the wording of Directive 2010/45 on available *methods* ("business controls" for example) is often used to justify a relaxed view of the regulatory *requirements*. This is a grave error: *businesses must still be able to prove integrity and authenticity of their invoices over a long period*, and this long-term evidence position is often not fully achieved by existing business control frameworks. Businesses should therefore analyse their ability to generate and maintain appropriate evidence across their different processes and trading relationships, and on that basis decide which mechanism is the most cost-effective to ensure compliance where gaps are identified. Since all businesses are different, no method is more or less appropriate than others are in an absolute sense.

When assessing the relative costs and benefits of available options, companies should base their ROI calculations on actual solution costing rather than preconceived ideas or popular views of what is cheap or expensive. When a service provider is involved on behalf of one or both trading partners, certain compliance methods may become more or less attractive due to this particular type of setup. One thing that has changed since entry into force of VAT Directive 2010/45/EU is that businesses, rather than mechanically adopting a technology-based compliance method, have started becoming more cognizant of the importance of high-quality end-to-end processes. This often leads to more awareness of strengths and weaknesses of existing processes, including a better understanding of the transaction evidence such processes naturally generate. Based on such a gap analysis, we see many businesses make choices for or against using technology (such as compliant EDI or qualified electronic signatures) for maintaining adequate integrity and authenticity evidence with more confidence and on a more strategic basis than previously. The worldwide trend towards wholly technology-based clearance schemes, as well as specific technological requirements for B2G e-invoices in a number of EU Member States, can be viewed as strengthening the case for a single layer of baseline technological controls that can be adapted to meet specific country requirements.

Readers more interested in a compendium about e-invoicing legislation in Europe and many other countries around the globe are recommended to read the TrustWeaver whitepaper as referenced in [1].

7. Appendix B: Glossary, Sources

7.1 Glossary

In the course of this report, a number of key notions are frequently referred to. To avoid any ambiguity, the following definitions apply to these notions.

Figure 35: Glossary

AR	Accounts Receivable
AP	Accounts Payable
Artificial Intelligence, AI	Broader concept of machines being able to carry out tasks associated with humans around learning and problem solving. It has the cognitive ability to look for and learn on certain patterns and to take appropriate actions.
B2B Invoices	In this report: Includes all tax compliant invoices to corporate as well as to the public sector; B2B & B2G/G2B
Bill	Includes all categories of bills sent to consumers (B2C/G2C)
Clearance System / Model	Legal regimes in which an electronic invoice must be sent to the tax administration or its licensed/accredited agent for authorization prior to, during or just after issuance as an original tax invoice.
DPO	Days payable outstanding is an efficiency ratio that measures the average number of days a company takes to pay its suppliers.
DSO	The days sales outstanding is a calculation used by a company to estimate their average collection period.
E-billing	"e-billing" covers in this report the electronic bills from Business-to-Consumers (B2C). Some market participants use this term alternatively for the process on issuer side in general, regardless if the customer is an enterprise or household.
EBPP	Electronic Bill Presentment and Payment; focus in B2C; this acronym is more popular outside Europe
EIPP	Electronic Invoice Presentment and Payment; focus in B2B/B2G; this acronym is more popular outside Europe
E-invoicing	Electronic invoicing is the sending, receipt and storage of invoices in electronic format without the use of paper-based invoices as tax originals. Scanning incoming paper invoices, or exchanging electronic invoice messages in parallel to paper-based originals is not electronic invoicing.
Internet of	Infrastructure of the information society. The inter-networking of physical

Things, IoT	devices, vehicles (also referred to as “connected devices” and “smart devices”), buildings, and other items—embedded with electronics, software, sensors, actuators, and network connectivity that enable these objects to collect and exchange data.
Invoice	Includes in this report all categories of invoices: B2B, B2C, B2G
Issuer	Invoice issuer, Supplier, Biller
Network operator	Service provider respectively operator with any-to-any model; an invoice issuer or recipient needs just one interface for achieving any other counterparty in the same network; In some countries, the terms “operator”, “service provider”, “consolidator” or “supplier network” are more common.
Order-to-Cash	Supplier perspective for the processes order-delivery-invoicing-payment
P2P	Wikipedia: “The e-procurement value chain consists of indent management, e-Informing, e-Tendering, e-Auctioning, vendor management, catalogue management, Purchase Order Integration, Order Status, Ship Notice, e-invoicing, e-payment, and contract management.” Purchasing is a subset of procurement. Purchasing generally refers simply to buying goods or services (order to payment). Purchasing often includes receiving and payment as well.
PO	Purchase Order
Procure-to-Pay	Buyer perspective for the processes of selecting vendors, establishing payment terms, strategic vetting, selection, the negotiation of contracts, actual purchasing of goods, order, delivery, invoicing and payment.
Purchase-to-Pay	Buyer perspective for the processes order, delivery, invoicing and payment. Purchasing is a subset of procurement.
SME	Small and Medium sized Enterprise
Recipient	Buyer, Customer; The individual or organization that will receive the invoice

7.2 Sources

Figure 36: Key sources used in this report

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